


2015

Pedagogical Praxis Models in Sustainability Education: A Focus on Food Systems and Environment

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PEDAGOGICAL PRAXIS MODELS IN SUSTAINABILITY EDUCATION: A FOCUS
ON FOOD SYSTEMS AND ENVIRONMENT

A Dissertation Presented

by

Karen L. Nordstrom

to

The Faculty of the Graduate College

of

The University of Vermont

In Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
Specializing in Natural Resources

January, 2015

Defense Date: November 6, 2014
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ABSTRACT

As societies embrace notions of sustainability, there is an increasing interest in how to best educate students about these concepts. The field of sustainability education (SE) is an approach that has been developed to address this concern. SE frameworks seek to integrate into curricular contents and formats within campus learning environments, in order to systematically improve upon approaches and services developed to support student learning and development. My research offers insight into the relationships between the philosophical principles and praxes of sustainability education, with the aim to inform educators on how best to prepare students to address complex sustainability issues.

I used three cases of University of Vermont courses and programs to explore theoretical and practical factors related to sustainability education and food systems, as follows: 1) a comparative analysis of Education for Sustainability (EfS) together with Sustainable Agriculture and Food Systems Education, 2) an integration of High Impact Educational Practices (HIEP) with the field of agroecology education, and 3) an in-depth program analysis that examined the role of HIEP in engaged learning alongside the EfS framework.

I drew from two action research (AR) traditions that determine particular research methodologies for applied social research settings. The first is a systems approach to organizational learning, and the second is teacher research for curricular and program development. I also engaged in utilization-focused evaluation (UFE) with program stakeholders. Research methods included applied social and mixed methods associated with program evaluation. Three main research implications include: a) Agroecology education in experiential, immersion environments can serve as a primary vehicle for sustainability education; b) sequencing of food systems and sustainability curricula can lead to transformative learning; and c) AR and UFE can serve as tools for program development alongside sustainability education frameworks.

DEDICATION

I dedicate this intellectual project to my family—to all those who’ve come before and to those who will take our place, engaging in the world in ways that make it a better place. In particular, I dedicate this work to my mother, Nancy K. Nordstrom, for her professional role modeling throughout my youth. I also dedicate this work to the memory of Ernesto’s father, Armando Jose Mendez Gamero, whose passing occurred during its final stages. In addition, this thesis is for my children, Adriel and Sofia.

ACKNOWLEDGEMENTS

Beginning with my dissertation committee, I'd like to express profound levels of gratitude to the many people who supported me throughout this endeavor. I extend my gratitude and appreciation to each of my committee members for guiding me through all research and teaching associated with this thesis work. I express high reverence and thanks to my co-advisor, Dr. Stephanie Kaza, for providing phenomenal support over the final stages of data analyses and writing. Her work was integral to making its completion a reality. Thanks is also due to my co-advisor, Dr. Thomas R. Hudspeth, for agreeing to serve as my primary advisor, for early guidance through the dissertation process, and for sharing his depth of knowledge in the field of sustainability education. I would also like to thank Dr. Amy B. Trubek for drawing me into collaborative work on the Vermont Milk to Maple course, and for inspiring me to work in the field of food systems education. I also extend thanks to Dr. Christopher J. Koliba for advising me in the use of applied social research methods.

I extend gratitude to my family. First, to my husband, Dr. V. Ernesto Mendez, I express gratitude for his unofficial membership on my dissertation committee, as he responded regularly to my evolving thesis ideas, questions, and uncertainties. I am thankful for our work together, crafting and teaching the immersion course in agroecology that became one of my research cases. Mostly, I am thankful for his enduring love and support throughout this process, even as he pursued his own tenure-track position at UVM.

I extend my appreciation and thanks to Drs. John Sama and Walter Poleman for allowing

me to engage in action research with the GreenHouse Residential Learning Community program, and for employing me as a Program Specialist in GreenHouse. In preparation for this work, I am indebted to Dr. Stephen R. Gliessman, who gave me the opportunity to coordinate the Program in Community & Agroecology at UC Santa Cruz, where my real interest in undergraduate agroecology education in residential settings emerged. I also express gratitude to my Master thesis advisor, Dr. Bob Hughes, who long ago planted the seed for me to pursue a Ph.D. In addition, I would like to thank all of the students, staff, faculty, and administrators who participated in my research.

I also extend my appreciation to our extended network of teachers and friends affiliated with UVM, with the Campus Children's Center, and with the Sustainability Academy at Lawrence Barnes, who have supported our family throughout this process. This thesis was completed through an orchestrated effort that involved extensive community support.

TABLE OF CONTENTS

	Page
DEDICATION	ii
ACKNOWLEDGEMENTS	iii
LIST OF TABLES	x
LIST OF FIGURES	xi
CHAPTER ONE: THESIS INTRODUCTION	
1.1. Introduction.....	1
1.1.1. Research Context	3
1.1.2. Philosophical Frameworks.....	5
1.1.3. Methodological Approaches	9
1.1.4. Research Methods.....	12
1.1.5. Dissertation Contents	15
CHAPTER TWO: VERMONT’S RURAL FOOD SYSTEM: FROM MILK TO MAPLE	
2.1. Introduction.....	18
2.2. Literature Review.....	22
2.2.1. Education for Sustainability.....	22
2.2.2. Sustainable Agriculture and Food Systems Education	24
2.2.3. Action Research	26
2.3. Methods.....	28
2.4. Results.....	33
2.4.1. Experiential Education.....	34

2.4.2. Values and The Land	38
2.4.3. Systems and Sustainability	44
2.5. Discussion	51
2.5.1. Experiential Education	52
2.5.2. Values and The Land	55
2.5.3. Systems and Sustainability	58
2.5.4. Course Development.....	60
2.6. Conclusions.....	64
2.7. References.....	74

CHAPTER THREE: CAFÉ EN TACUBA: COFFEE ECOLOGIES AND LIVELIHOODS IN A SHADE COFFEE LANDSCAPE OF EL SALVADOR

3.1. Introduction.....	78
3.2. Literature Review.....	79
3.2.1. Agroecology Education	79
3.2.2. High-Impact Educational Practices (HIEP)	82
3.3. Methods.....	87
3.4. Results.....	93
3.4.1. Agroecology Education	93
3.4.2. High Impact Educational Practices.....	98
3.4.2.1. Study Abroad	99
3.4.2.2. Learning Community	102
3.4.2.3. Service-Learning.....	105
3.4.2.4. Undergraduate Research	107
3.5. Discussion	109

3.5.1. Agroecology Education	109
3.5.2. High Impact Educational Practices	112
3.5.2.1. Passive Aspects of Immersion Course Design.....	113
3.5.2.1. Active Aspects of Immersion Course Design	117
3.5.3. Study Limitations and Recommendations	120
3.6. Conclusions.....	123
3.7. References.....	128
CHAPTER FOUR: GREENHOUSE RESIDENTIAL LEARNING COMMUNITY	
4.1. Introduction.....	131
4.2. Literature Review.....	134
4.3. Methods.....	137
4.3.1. Research Context	137
4.3.2. Research Approach	142
4.3.3. Phase One: Institutional Evaluation and Measures of Success.....	144
4.3.4. Phase Two: Action Research and the Student Experience	146
4.3.5. Limits to Study.....	147
4.4. Results.....	148
4.4.1. Phase One: Institutional Evaluation and Measures of Success.....	149
4.4.1.1. Perseus Year-End Surveys.....	149
4.4.1.2. Institutional Studies Assessment: Completion, Retention, and GPAs.....	150
4.4.1.3. Student Interviews	151
4.4.1.1.1. Sense of Community and Place	152
4.4.1.1.2. Experiential and Action-Oriented Approach	155

4.4.1.1.3. Personal Development and Shared Values	158
4.4.2. Phase Two: Action Research and the Student Experience	160
4.4.2.1. Design Charrette One: Student Engagement within a Place-Based Community	161
4.4.2.1.1. Sense of Community and Place	162
4.4.2.1.2. Experiential and Action-Oriented Approach	164
4.4.2.1.3. Personal Development and Shared Values	165
4.4.2.2. Design Charrette Two: Sense of Place and Active Second Year Engagement	166
4.4.2.2.1. Sense of Community and Place	167
4.4.2.2.2. Experiential and Action-Oriented Approach	168
4.4.2.2.3. Personal Development and Shared Values	169
4.4.2.3. Design Charrette Three: Residential Diversity and Inclusivity Focus.....	170
4.4.2.3.1. Sense of Community and Place	171
4.4.2.3.2. Experiential and Action-Oriented Approach	173
4.4.2.3.3. Personal Development and Shared Values	174
4.4.3. GreenHouse Program Planning and Evaluation Tools	176
4.4.3.1. Design Charrette Four: Strategic Systems Thinking for Program Development	179
4.4.3.1.1 Sense of Community and Place	180
4.4.3.1.2. Experiential and Action-Oriented Approach	181
4.4.3.1.3. Personal Development and Shared Values	182
4.5. Discussion	184
4.5.1. Critical Review of Three Themes	185

4.5.1.1. Sense of Community and Place	186
4.5.1.2. Experiential and Action-Oriented Approach	188
4.5.1.3. Personal Development and Shared Values	191
4.5.2. GreenHouse Hub Within a Campus Culture of Sustainability	195
4.5.3. Program Planning and Evaluation Tools	198
4.5.4. Limitations and Recommendations.....	200
4.6. Conclusions.....	204
4.7. References.....	211
CHAPTER FIVE: DISSERTATION DISCUSSION	
5.1. Pedagogical Praxis in Sustainability and Food Systems Education	215
5.1.1. Sustainability Education and High Impact Educational Practices	219
5.1.2. Course Development and Research Recommendations	223
5.2. Limits to Study.....	226
5.3. Implications of the Research Findings.....	228
BIBLIOGRAPHY	231
APPENDICES	239

LIST OF TABLES

Table	Page
2.1. Course Structure Summary for the Milk to Maple immersion course.....	29
2.2. Data collected and analyzed for the Milk to Maple immersion course	31
3.1. Course Structure Summary for the Café en Tacuba immersion course.....	90
3.2. Data collected and analyzed for the Café en Tacuba immersion course	91
4.1. Phase Two: Design Charrette (DC) Stakeholder Representation	146
4.2a. Demographic Information: Academic Rank.....	150
4.2b. Demographic Information: Total Years As UVM Student.....	150
4.2c. Demographic Information: Identification	150
4.2d. Demographic Information: Gender.....	150
4.3. Comparison of completion, retention, and GPA rates	151
4.4. GreenHouse Curricular Elements	157
4.5. Meaningful GreenHouse Activities	159
4.6. Students’ examples of meaningful village-scale engagement	166
4.7. Examples of meaningful second-year experiences	170
4.8. Suggestions for building an inclusive community through meaningful events...	175
4.9. GreenHouse logic model.....	178
4.10. Suggestions for course improvements, based on meaningful activities	183
4.11. Education for Sustainability in GreenHouse.....	194
5.1. Sustainability Education and High Impact Educational Practices Overview	216

LIST OF FIGURES

Figure	Page
2.1. Shared principles of SAFSE and EfS.....	34
2.2. Pedagogical Praxis Continuum for SAFSE and EfS.....	66
3.1. Café en Tacuba Case Study Description.....	88
4.1. GreenHouse Case Study Description.....	138

CHAPTER 1

INTRODUCTION AND CONCEPTUAL FRAMEWORKS

Public interest in food systems has soared. People have become aware of the impacts of the highly industrialized global food system that resulted in the production of cheap and plentiful foods via a consolidated provisioning system (Wright, 2006). Consumers want to know about the origins and production practices of their food, and about how production and processing practices impact human health and the environment (Hinrichs and Lyson, 2007). With raised awareness about dire food systems problems, from mad cow disease and hunger to the plague of obesity and pesticide toxins piercing the food chain, the American public is responding by re-localizing agriculture and food production in efforts to improve community social and economic development (Lyson, 2004; Wright, 2006; Ackerman-Leist, 2013). For instance, fresh fruit and salad bars are becoming available in school lunches, and community gardens that produce organic food are sprouting in impoverished neighborhoods (Allen, 2004; Ackerman-Leist, 2013). These efforts align with recent social movements that aim to influence government policies and programs in support of sustainable agriculture and community food security—an attempt to re-build the food system for improved environmental health and longevity, as well as for economic viability and social justice (Allen, 2004; Berry, 2009). Allen and Berry also found that these food movements have focused primarily on the realms of production-oriented sustainable agriculture, and on the distribution and consumption components associated with food access and nutrition problems.

In response to global sustainability issues focused on food systems, higher

education institutions are engaging in higher levels of research and teaching within this field. In particular, Carroll (2009) noted that Land Grant Institutions play a main role in teaching and research about the technical and social facets of food production. This trend began with faculty teaching and research that focused on organic farming (Allen, 2004). Systems approaches to teaching and research also emerged as a strategic way to influence systemic change in food systems (Francis, Lieblein et al., 2001). Based on his work that brought university students together with farmers, Bawden (1991) offered insights into the role of systems thinking and research for the application of systems principles in the educational arena (Francis, Jordan et al., 2011). These formats were found by these researchers to require a paradigmatic shift in agricultural research and education that would address rapid changes in agricultural and global economic development. Current research initiatives in agriculture and food systems suggest systems thinking for studying food systems complexity alongside issues of global environmental change. For instance, the work of Ericksen (2008) highlights urgent “need to address topics of food security, ecosystem services, and social welfare as efforts are made to build more resilient food systems in the face of global environmental change” (p. 234).

(De Schutter, 2010) frames these present-day systems challenges in the field of agriculture around the “human right to adequate food.” He identifies agroecology as the key field for approaching present-day agricultural development, citing how the field has addressed topics of food security with many at-risk groups worldwide, as well as its’ contributions to sustainable economic development. As the field of agroecology has advanced, a parallel interest has grown in agroecology education, a new approach and philosophy for food systems instruction.

1.1 Research Context

Two cases at the University of Vermont brought together my theoretical and practical interests in sustainability education, agroecology, and food systems. Their particular contexts and settings allowed me to engage in action research and utilization-focused evaluation for both course and program development as well as for organizational learning and development. The first case was represented by two courses, each comprising short-term immersion programs with a focus on food systems. The first was part of an exchange program on food systems graduate education developed between UVM and New York University (NYU), and titled *Vermont's Rural Food System: From Milk to Maple (Milk to Maple)*. The second was titled *Café en Tacuba: Coffee Ecologies and Livelihoods in a Shade Coffee Landscape of El Salvador (Café en Tacuba)*, and it represents an upper-division undergraduate Faculty-Led Program Abroad course offered through UVM. The second case was the *GreenHouse Residential Learning Community (GreenHouse)*, one of five residentially-based learning communities on the UVM campus. GreenHouse targets place-based ecological and active citizenship outcomes with its student body.

The research conducted on *Milk to Maple* completed a comparative analysis of Education for Sustainability (EfS) together with Sustainable Agriculture and Food Systems Education (SAFSE) for the purpose of improved graduate-level curricular design and development in food systems. The course was originally designed for Masters-level Food Studies students from New York University to meet student interest in agricultural production and food systems through experiential environments. It was later open to

UVM students enrolled in the Masters in Food Systems program. Its iterative design offered insight into improving learning outcomes, educational design and evaluation within curricula integrating sustainability and agro-food systems.

The upper-division undergraduate *Café en Tacuba* immersion course allowed me to study the integration of four High Impact Educational Practices (HIEP) with the field of agroecology education, a field that has matured and is now prime for engaging students in SAFSE. These four HIEPs include: 1) Study Abroad (SA), 2) Learning Community (LC), 3) Service-Learning (SL), and 4) Undergraduate Research (UR). This study demonstrates the powerful role that HIEP play in contextualized agroecology education when targeting SAFSE outcomes.

Longitudinal research housed within the lower-division undergraduate *GreenHouse* program allowed me to engage in in-depth program analysis alongside the EfS framework. The study further examined the role of HIEP in engaged learning that targeted sustainability-oriented outcomes. In addition to the research focus on co-curricular development, there was an important element that targeted program assessment and organizational learning. Through use of specific research and evaluation processes guided by action research and utilization-focused evaluation, I gained insight into their instrumental use for both program development and improvement.

Each of these three studies offers insight into the relationships that exist between the philosophical principles and praxes of sustainability education. The purpose for this research was to better understand how such contexts seek to achieve profound levels of engaged learning and personal development that prepare students to address complex sustainability issues. By conducting research in these learning environments, I further

sought to help situate them within the inexorably linked context of higher education's role in tackling global sustainability challenges.

1.2 Philosophical Frameworks

Shared objectives and values are among the subsets of concepts that exist within the evolving educational philosophies and frameworks that have emerged in an effort to educate for sustainability. Two overarching sustainability education frameworks addressed in this research include Education for Sustainability and Education for Sustainable Development. Education for Sustainability (EfS) is an emergent property of environment-based education scaling up to address complex issues in a rapidly changing world. The Cloud Institute for Sustainability Education (2011) describes how EfS developed through acknowledgement of a clear difference between education *about* sustainable development and education *for* sustainable development. Thus, sustainability education, as an umbrella concept for EfS and Education for Sustainable Development (ESD), focuses on the Triple Bottom Line of social, economic, and environmental interdependence for sustainability. EfS is characterized by the following broad principles: 1) holism and systems thinking, 2) interdisciplinary understanding of ecological systems, 3) emphasis on active, experiential, and inquiry-based learning, and 4) contextualized problem-solving within communities (Cortese, 2003; Sterling, 2004; Garcia, Kevany et al., 2006). ESD stemmed from the World Summit on Sustainable Development and aims to distinguish education as a means rather than an end, with intention placed on governments learning to forecast well into the future, so that their decisions support the future of the economy, environment and society (Fien, 2011).

Tilbury (2011) indicated that a positive educational shift proposed by ESD is to move from changing behavior to more focus on structural and institutional change. The fundamental objective shared between ESD and EfS underscores problem-solving for three purposes: 1) protection for the environmental systems that support life, 2) enhancement of social justice for the world population, and 3) assure suitable economic development (Jacobson, McDuff et al., 2006).

Sustainable Agriculture and Food Systems Education (SAFSE) and Agroecology Education (AE) are sustainability education frameworks that target sustainability within the field of food systems. The growing field of Sustainable Agriculture and Food Systems Education (SAFSE) is evolving alongside the field of agroecology as the study of food systems as a science, a practice, and a movement. SAFSE shares many of the principles and practices of EfS. These principles and practices include: 1) interdisciplinary and systems-based approaches to learning, 2) action-oriented learning integrated with reflective practice, and 3) problem-based learning for skills development (Francis, Lieblein et al., 2001; Jordan, Andow et al., 2005; Trexler, Parr et al., 2006; Jordan, Bawden et al., 2008; Francis, Jordan et al., 2011; Moncure and Francis, 2011; Parr and Trexler, 2011; Hilimire, Gillon et al., 2014). EfS and SAFSE call for experiential, applied and community-based learning that are place-based and rely on integrating the social sciences with the natural sciences for an interdisciplinary understanding of natural systems in order to build a socially-engaged populace (Francis, Lieblein et al., 2001). Such contextualized learning through direct connections to farming and food systems provides interdisciplinary opportunities for students to apply systems thinking to their construction of knowledge and skills. (Lieblein, Francis et al., 2000;

Francis, Lieblein et al., 2001; Wright, 2006).

Agroecology Education (AE) is a field well-suited to carry out the praxis connected to overlapping principles associated with all three of these SE frameworks. Key AE principle overlap with EfS and SAFSE include: interdisciplinary, systems-approaches to learning and hands'-on and experiential contexts that build problem-solving skills, such as those associated with agroecosystem change and management (Francis, Jordan et al., 2011). These three educational frameworks share the goal of preparing students with key competencies required to address such complex challenges through use of facilitated experience and reflection. Reflection as a socially constructivist practice acts toward worldview transformation. In agroecology, the intended outcome of this practice is social change relevant to sustainable agricultural development (Jordan, Andow et al., 2005; Jordan, Bawden et al., 2008). The major differences existing between EfS, SAFSE, and AE rest in the numerous and varying combinations of pedagogical praxes that are utilized to engage these philosophical principles, all of which attempt to align knowledge, attitudes, behaviors and skills toward sustainability. AE, however, is most closely aligned with the concept of sustainable development as it directly applies to agroecosystem management challenges in developing countries and addresses community needs associated with the globalized and industrialized food system. Thus, AE links closely with ESD. Together, these four philosophical educational frameworks relate pro-environmental behaviors to an application of critical thinking skills that will engage citizenry in effective problem-solving for societal renewal.

EfS, SAFSE, and AE introduce the concept of a broad learning community,

wherein faculty and instructors serve as both co-learners and co-facilitators of knowledge. They work alongside food systems actors and organizations to enrich the learning environment with multiple worldviews and epistemologies in an effort to engage stakeholders in transformative learning. This student-centered learning draws away from the mechanistic transmission of knowledge from expert to student characteristic of traditional educational contexts. Rather, these student-centered contexts are comprised by an action-orientation and facilitated direct experiences. They include applied and community-based settings that integrate well with inquiry-based and problem-based learning and emphasize the essential role of facilitated reflection on these direct experiences. Together these principles and approaches are intended to guide students toward a holistic understanding of the world and provide them with strong analytical, communication, technology and leadership skills to become change-makers of the future.

The type of *engaged learning* embedded within these educational frameworks is an emergent trend in undergraduate education (Waters, 2006). Weaver (2013) reflects on engaged learning by stating that “as much as half of the learning that goes on in college takes place outside of the classroom.” Engaged learning is characterized by “safe spaces” that encompass respect and openness for dialogue and inquiry about global issues and perspectives (Murphy, 2010). Students engage “with the human condition” in order to learn “about humanity” (Bowen, 2005, p. 5). Another essential element of engaged learning is similar to active, experiential, multidisciplinary and service-learning, where the focus is on the learner and the learning environment (Bowen, 2005). It involves service learning as an important pedagogy that “connects meaningful service to academic learning, personal growth and civic responsibility” so that students develop “critical

literacy and independent thinking necessary for successful engagement with present-day society (Murphy, 2010, p. 39-40).

1.3. Methodological Approaches

As stated by Herr & Anderson (2005), there are numerous philosophical and social action research traditions that determine particular research methodologies and epistemologies for applied social research settings. For the purposes of this research, I draw from two of them. This first is action research (AR). Herr & Anderson (2005) explained that AR stemmed from action science, with a focus on a systems approach to organizational learning and that emphasizes the importance of communication for organizational change. The second is teacher research, which grounds AR in education settings for purposes such as curricular and program development. The goal of action science, as a precursor to AR, is the generation of ‘knowledge that is useful, valid, descriptive of the world, and informative of how we might change it’ (Herr & Anderson, 2005, p.14), and involves the “development of insights, knowledge, and associations between past actions, the effectiveness of those actions and further action” (Russ-Eft & Preskill, 2001, p. 57). Action science supports an epistemology grounded in the work experiences of people in real world situations, and promotes the application of AR to the context of organizational learning, development, and change (McNiff and Whitehead, 2000; Herr and Anderson, 2005; Koliba and Lathrop, 2007).

For this research, I selected AR as it creates space for both individual professional development and for collaborative professional and institutional progress (Herr and Anderson, 2005). Adopting and establishing AR praxis within organizations is a

multifaceted management pursuit, which requires the development of effective learning environments that involve people in the processes of observation and reflection on their actions. In *GreenHouse*, I utilized AR for organizational learning, development, and change, yet it also offered insight into broader-based implications for sustainability education in higher education. I worked with administrators to craft space for program stakeholders to engage as reflective practitioners for the purposes of program development and improvement. This “interpretive approach,” as described by McNiff & Whitehead (2001) and Russ-Eft & Preskill (2001) built upon inquiry-based practice toward problem-solving in the workplace. This praxis generates theory, which both enables people to better understand their own learning and helps them structure future action. In *GreenHouse*, this praxis supported the development of a logic model that served as a program evaluation and development tool.

My research draws from the related field of program evaluation by engaging with research stakeholders in utilization-focused evaluation (UFE). UFE is a ‘user-focused approach’ to program evaluation, which places emphasis on the interests of stakeholders, including information needs, such as information relevant to making decisions, judgments, comparisons, or the assessment of program goals (Patton, 1982, p. 35). He summarized the evaluation process as “the systematic collection of information about a broad range of topics for use by specific people for a variety of purposes” (Patton, 1982, p. 35; Patton, 1997). Aligned with the ideas of Patton (1997), who described how the evaluation would be more likely to be useful if the stakeholders understand and feel ownership over both the process and findings, my role was to keep evaluation processes and design in mind throughout, with thought towards how these actions would affect use.

This requires decisions around whose values will frame the evaluation by working with primary users who will have the responsibility of implementing the recommendations that are collaboratively identified based on findings (Ibid.). A primary function of the evaluation is to support action within the educational program. The idea behind this evaluation process is “intended use by intended users,” wherein the evaluator is a facilitator of decision-making, highly engaging the users in each phase of the evaluation (Patton, 1997, p. 20).

Similar to AR praxis, evaluation can be tied to organizational learning as a way to encourage success amidst rapidly changing social, political, and economic climates (Russ-Eft and Preskill, 2001). My work aligned with the ideas of Russ-Eft & Preskill (2001), who discuss the focus of evaluation researchers on the collaborative nature of organizational learning for the purposes of ongoing organizational improvement and change. They describe how evaluation can serve as a catalyst for workplace learning, as organizational practitioners engage in collaborative communication around critical issues that leads to action. They further state that evaluation thus serves as a tool to adapt to changing social and economic conditions, as they consider the transformative nature of socially constructed knowledge that occurs through evaluation processes and reflection on findings. Koliba & Lathrop (2007) and McNiff & Witehead (2001) describe how both AR and evaluation are often supported by researchers, whose role is to supervise the research, provide documentation support of the process and highlight action outcomes (McNiff and Whitehead, 2000; Koliba and Lathrop, 2007). Russ-Eft & Preskill (2001) describe the role of evaluators as “more akin to that of a facilitator, educator, coach, mentor, trainer, and guide,” whose work is influenced by the “internal systems and

structures” of the organization (p. 58). These descriptions mirror my roles leading AR and UFE processes in the sustainability-themed GreenHouse and in immersion-based courses focused on food systems. My role reflected their descriptions of the researcher who documents and analyzes emergent themes from AR and evaluation praxes for the purposes of organizational learning (Koliba and Lathrop, 2007).

1.4. Research Methods

AR has an orientation toward gaining understanding through hermeneutic interpretation. Research methods toward this aim include textual, conversation, and discourse analysis, as well as ethnographic and other qualitative methods. These qualitative characteristics of AR are crucial to engage students and instructors in a dynamic research process that connects thought and action (Stapp, Wals et al., 1996). Methods for completing a utilization-focused evaluation can be formative, summative, developmental, using qualitative, quantitative or mixed methods. In *GreenHouse*, I utilized mixed methods for formative and summative assessment purposes. With my immersion course case studies, I utilized formative, developmental and qualitative methods for course development. These methods may be grounded in either naturalistic or experimental design, and may focus on many different aspects of the program, such as program processes or outcomes (Patton, 1997).

For these studies, I utilized naturalistic inquiry. Capturing action-oriented and evaluative processes by means of naturalistic inquiry from a holistic and developmental perspective helped me gather appropriate information for the given contexts. To begin this process, I followed Patton’s work (1987) and undertook an evaluation aimed at

understanding the internal dynamics of program and course operations, with an additional emphasis on formative evaluation, intended to improve these programs. This involved me in review of program archives and course planning documents, and I conducted interviews with key informants to gather background information about these cases. Sampling strategies for planning purposes included purposeful sampling for information-rich cases and homogenous samples to describe particular subgroups in depth. Snowball sampling, described by Patton (1987) as the identification of additional research participants from the original group of participants, also emerged based on suggestions from key informants. By using a grounded theory approach to program evaluation in the form of developing theory inductively from continual interaction with the data (Patton, 1987; Yin, 1993; Maxwell, 1996), I was placed in the role of generating program theory from triangulation of these data. Theory was then shared with stakeholders to verify program processes and to consider further testing.

Ethnographic research methods that were used for these particular contexts included the three kinds of qualitative methods identified by Patton (1987) as commonly used in evaluation research. These methods include: 1) direct observation; 2) in-depth, open-ended interviews, and 3) written documents, including open-ended questionnaire items, journal reflections, and program archives. Yin (1993) described how positions within research contexts limit objective distance between the researcher and the phenomena of study. My teacher-researcher perspective that came with my internal role in these contexts provided multiple entryways for conducting ethnographic research methods. I engaged in the direct experience of fieldwork, conducting participant observation, which included writing ethnographic field notes for the purpose of gleaning

data from the observational process. These notes were intended to “detail the social and interactional processes that make up people’s everyday lives and activities,” and the process gave “special attention to the indigenous meaning and concerns of the people studied” (Emerson, Fretz et al. 1995, p. 11). I followed Patton’s (1987) suggestion that field notes focus on program activities and participant behavior, namely by documenting both participants’ language and interactions with one another, as well as my own reactions to the setting and to these situations. In line with the ideas of Yin (1993), these methods enabled me to build program theory from the socially constructed reality unique to each program’s context. I also performed document review of student assignments for each study, placing emphasis on journal postings, reflective essays, and open-ended written items on questionnaires. These data served to triangulate with the field notes and interview and focus group transcriptions for an inductive analysis. Additional data collection were based on qualitative methods outlined by Maxwell (1996), Patton (1987), and Yin (1993). These data included detailed descriptions of program activities, human interactions, document passages, and direct quotations, which were then compiled and organized using selective coding strategies into major themes, through a grounded theory approach to content analysis.

Case studies are an appropriate research method when the investigation must cover both a particular phenomenon and the context within which the phenomenon is occurring (Yin, 1993). “Such a phenomenon,” states Yin (1993) “may be a *project* or *program* in an evaluation study” (p. 3). In the case of GreenHouse, where I studied the phenomenon of student engagement, the contextual aspects of program design, including aspects of program size and program facilities, were essential factors that contributed to

this phenomenon. With regard to the agro-food systems immersion courses, their contexts were central to understanding the relationships between the various design and pedagogical components of the courses and the outcomes related to learning objectives and student development. As case studies, they allowed me to analyze their contexts in relation to other agro-food systems courses taught through UVM. To ensure internal validity of this case-based research, I used multiple measures during data collection to establish a chain of evidence that informed them. I also employed member checks with key informants, as suggested by Yin (2009), in order to guarantee the validity of my findings. Also following Yin (2009), I looked for patterns that emerged from the data, from which program theory was established, and developed a logic model for one of these contexts. As I was working with multiple cases, I developed databases for each that held the evidence and served as a way of distinguishing the data from the research findings, a method determined by Yin (2009) to make certain that this research is reliable.

1.5. Dissertation Contents

The major contents of this dissertation consist of three chapters that contain my three articles written in formats intended for publication. The two chapters that follow this introduction are written about my research with the two food systems immersion courses, respectively. The second chapter addresses the first immersion course case that took place in Vermont, and is titled *Vermont's Rural Food System: From Milk to Maple (Milk to Maple)*. This article will be submitted to the Journal of Agriculture, Food Systems, and Community Development. The third chapter addresses the second case study immersion course, titled *Café en Tacuba: Coffee Ecologies and Livelihoods in a*

Shade Coffee Landscape of El Salvador (Café en Tacuba). This article will be submitted to the Journal of Sustainable Agriculture. These two chapters on immersion courses in food systems are followed by my third research case. This fourth chapter focuses on, and is thus titled, *GreenHouse Residential Learning community (GreenHouse)*. Articles focused on GreenHouse will be submitted to both the International Journal of Sustainability in Higher Education and to *Talking Stick Magazine*.

Each of these three studies targets sustainability-oriented learning outcomes, and each addresses sustainability in food systems. Findings from these three studies address how educational frameworks focused on sustainability can advance sustainability and food systems education in higher education. The *GreenHouse* chapter entails a more comprehensive review of program development, when compared to the course development and food systems focus of the two immersion courses. Its broader scope of sustainability education focused on lower-division, undergraduate residential learning was analyzed in relation to program goals of place-based ecological literacy and active citizenship. The GreenHouse study involved three phases: 1) an institutional evaluation that measured program success, 2) action research processes for program development, and 3) development of an evaluative tool to further program development. Through this study, I was able to learn about the integration of participatory evaluation and sustainability education in ways that address: a) higher education systemic change, and b) undergraduate, engaged, and high-impact learning for educational transformation.

Although these studies consist of differing research objectives and findings, I was able to holistically garner information from them that can benefit the fields of sustainability and food systems in higher education. The final chapter of this thesis

discusses major findings of this study. This section includes four major pedagogical praxes associated with sustainability education, and key findings from the integration of high-impact educational practices with undergraduate learning communities. The section closes with study limits and research implications for sustainability education. There is no separate literature review chapter for this thesis, but rather in-depth reviews associated with each case study.

CHAPTER 2

VERMONT'S RURAL FOOD SYSTEM: FROM MILK TO MAPLE

2.1. INTRODUCTION

Higher education institutions are addressing sustainability issues through the concept of Education for Sustainable Development and related educational frameworks (Rebello, 2003; Garcia, Kevany et al., 2006). Sustainable development approaches have led to advancements aimed to reduce human impacts on natural resources, environmental education that holds people accountable for the environmental impacts of their behavior, and environmental policy (Finger and Asun, 2001). This progress has resulted in a deceleration of the processes of ecological degradation, yet these advancements have been slowed by the rapid growth of processes such as global industrial development (Ibid.). The Decade of Education for Sustainable Development (DESD, January 2005-December 2014), has generated significant support from the United Nations Educational, Scientific, and Cultural Organization (UNESCO) to advance research, monitoring and evaluation to further develop higher education institutions so that they focus more clearly on the underlying principles and values of sustainability (Section for Education for Sustainable Development, 2005). This includes improving education so that it draws attention to critical issues that play a role in ecological degradation (e.g. human consumption, biodiversity loss and climate change). Addressing these topics requires an educational response that prepares societies for addressing the challenges of sustainability (Finger and Asun, 2001). Education for Sustainability is a framework currently called upon to address complex world issues, which, in the words of Keeling (2004),

“will affect the structure and content of college curricula, the nature of campus learning environments, and the methods, systems, and services colleges and universities develop to support student learning” (p.6).

The Education for Sustainability (EfS) framework utilized for this research analysis is one response to these “grand challenges.” EfS is characterized by the following broad principles: 1) holism and systems thinking, 2) interdisciplinary understanding of ecological systems, 3) emphasis on active, experiential, and inquiry-based learning, and 4) contextualized problem-solving within communities (Cortese, 2003; Sterling, 2004; Garcia, Kevany et al., 2006). As identified by Sterling (2004) in his publication on the international development of sustainability education, holism and systems thinking serve as a way to shift educational policy and praxis toward an emphasis on the nature of the learning experience rather than on predetermined outcomes. He describes how facilitated experience nurtures personal or social transformation via a constructivist view of the learner that places importance on the learning context and on the learner’s prior experience, disposition, and uniqueness. It also expedites capacity building in the form of critical, systemic and reflexive thinking that results in a systemic worldview shift. He further describes how this transference directs societal concern and perception toward the integrated economic, social, and environmental interdependence of issues—ultimately with the intention of creating new patterns of behavior toward the environment, from individuals to groups and to society as a whole.

The growing fields of Sustainable Agriculture and Food Systems Education (SAFSE) are evolving alongside the field of agroecology as the study of food systems as

a science, a practice, and a movement. SAFSE shares many of the principles and practices of sustainability education. These principles and practices include: 1) interdisciplinary and systems-based approaches to learning, 2) action-oriented learning integrated with reflective practice, and 3) problem-based learning for skills development (Francis, Lieblein et al., 2001; Jordan, Andow et al., 2005; Trexler, Parr et al., 2006; Parr, Trexler et al., 2007; Jordan, Bawden et al., 2008; Francis, Jordan et al., 2011; Moncure and Francis, 2011; Hilimire, Gillon et al., 2014). As institutional interest in sustainability increases, innovative programs are showing how the integration of sustainable agriculture and sustainability education can yield positive results for teaching and learning content in both of these thematic areas. These promising initiatives also highlight a pressing need to develop effective program evaluation models that will document curriculum design and program development and evaluate educational effectiveness (Parr and Trexler, 2011). Promising models for assessing program outcomes include action research and utilization-focused evaluation, as they make room for learning processes to take place within the organizational structures of higher education. These processes allow all stakeholders involved in these programs to reflect upon the contextual influences (local, regional, collaborative) and their educational approaches, in order to make space for reflection on the creative design and development of educational materials (Garcia, Kevany et al., 2006).

This research completes an analysis of the relationship between EfS, SAFSE and curricular design and development within an immersion-based food systems graduate course at a Land Grant University. It is represented by a course titled *Vermont's Rural Food System: From Milk to Maple* ("Milk to Maple") that was collaboratively designed

in 2006 by a University of Vermont faculty member in the Department of Nutrition & Food Sciences and a faculty member of Food Studies at NYU. The collaborative resulted in creating a course in Vermont for the New York University Masters in Food Studies program. It was intended to fulfill an educational need for students who either came from agricultural backgrounds or for systems-oriented students who wanted to see production in a hands-on manner. It was characterized by its short-term, 8-10 days, and highly experiential nature that provided design challenges associated with academic rigor and assessment. It consisted of “pre-departure” and “re-entry” components that served to prepare students for the immersion portion of the course with readings and online discussion and then an assessment period following the experiential portion. These were designed to support students in completing assignments and engaging in reflective practice that both focused on course content and enabled them to participate in evaluation processes. This project tested experiential and transformative learning theories within the context of SAFSE. It further examined links between this immersion context and the EfS framework, particularly with reference to transformative learning for social change. Findings from this examination provide valuable feedback to improve learning outcomes, educational design, and evaluation for sustainability content within curricula integrating sustainability and agro-food systems.

2.2. LITERATURE REVIEW

2.2.1. Education for Sustainability (EfS)

Sustainability education focuses on the Triple Bottom Line of social, economic, and environmental interdependence for sustainability. This focus requires a transformative shift in pedagogical praxis that cultivates student learning via a holistic educational model rooted in interdisciplinary and inquiry-based learning that fosters solid analytical, communication, technology, and leadership skills. The theoretical framework underlying Education for Sustainability (EfS) stems from environmental education philosophy, situated within a ‘postmodern ecological worldview’—an emerging worldview that has been explained as systemic, holistic, and participative, (Huckle and Sterling, 1996; Cortese, 2003; Barlett and Chase, 2004; Corcoran and Wals, 2004; Sterling, 2004; Garcia, Kevany et al., 2006). In this view, “ideas shift from ‘things’ to relationships, and from a segregated and dualistic view of the world towards an integrative and participative perspective” (Sterling, 2004, p. 55). This notion rejects the deterministic position of education and moves it toward a focus on the holistic nature of the learning experience (Jickling, 2000; Sterling, 2004). Requirements that must be met at the higher education level that encompass holism and systems thinking include a fundamental, transformative shift in thinking, values, and action; interdisciplinary systems thinking in all majors and disciplines; an emphasis on active, experiential, and inquiry-based learning; and contextualized problem-solving within communities (Cortese, 2003; Sterling, 2004; Steiner and Posch, 2006). Included in this discourse is a focus on the need to provide inter- and trans-disciplinary systems thinking opportunities within educational environments (Smith and Williams, 1999; Calder and Clugston, 2003;

Cortese, 2003; Rebello, 2003; Cullingford, 2004; Garcia, Kevany et al., 2006; Rowe, 2007). This movement toward systems thinking surpasses the mechanism and reductionism of the modern paradigm, allowing for a systemic worldview that enables educators to integrate the social, economic, and political elements of current world issues into educational curriculum (Sterling, 2004).

As defined by Mezirow (2000), “*transformative learning* refers to the process by which we transform our taken-for-granted frames of reference (meaning perspectives, habits of mind, mind-sets) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action” (p. 8). Transformative learning is a response to the pedagogical approaches in sustainability education that focus on process as well as content, requiring the implementation of interdisciplinary, collaborative, and experiential educational practices (Corcoran and Wals, 2004). Moore (2005) explains that such constructivist practices provide room for inquiry, dialogue, reflection, and action about the concept and goals of sustainability, so that students will have the opportunity to engage in critical self-reflection and a shared construction of meaning. Constructivism further embodies the nature and individuality of the learner, the importance of the learning context, and the learners’ prior experiences on their cognitive development (Sterling, 2004). In addition to the emphasis on the individual, constructivism often occurs in group settings, and is thus a highly participatory process (Sterling 2004). Through dialogue, involving “debate, critical discourse, and issues clarification” (Parr, Trexler et al., 2007, p.530), students work towards developing competencies needed to engage students in democratic civic participation of a global

nature (Sterling, 2004). Such a global citizenry, rooted in a “culture of sustainability” (Gadotti, 2003, p.205), provides possibilities for changes in ‘habits of mind’ or ‘points of view’ and the creation of new patterns of behavior toward the environment, from the individual level through groups and to society as a whole (Moore, 2005, p.82). Transformative education thus attempts to “shift concern and perception in wider society from ‘single-issue environmentalism’ towards a holistic realization of the economic, social, and environmental interdependence of issues”(Sterling 2004, p.59).

2.2.2. Sustainable Agriculture and Food Systems Education (SAFSE)

SAFSE is represented by a combination of select pedagogies, including: 1) interdisciplinary and systems-based approaches to learning, 2) action-oriented learning integrated with reflective practice, and 3) problem-based learning for skills development (Francis, Lieblein et al., 2001; Jordan, Andow et al., 2005; Trexler, Parr et al., 2006; Jordan, Bawden et al., 2008; Francis, Jordan et al., 2011; Moncure and Francis, 2011; Parr and Trexler, 2011; Hilimire, Gillon et al., 2014). Interdisciplinary and systems-based approaches to SAFSE involve purposeful integration of concepts and methods from natural and social sciences (Francis, Lieblein et al., 2001; Trexler, Parr et al., 2006; Hilimire, Gillon et al., 2014). Systems-approaches to SAFSE utilize multiple methods and scales of inquiry and enhance opportunities for problem-based learning within parameters framed by the interdisciplinary topic or problem of choice (Hilimire, Gillon et al., 2014). These authors state that direct experience coupled with systematic reflection helps students make meaning from their experiences, and has the capacity to encourage them to apply theoretical and innovative problem-solving to applied food systems studies.

Francis, Lieblein, et al. (2001) suggest a “broad concept of faculty and action-based learning,” that integrates the expertise of food systems actors and organizations into the educational process, enriching opportunities for social learning through the shared and multiple worldviews and epistemologies of such a broadened learning community (p. 90). They describe how this creates a modified role for the instructor, who serves as a co-learner and co-facilitator of knowledge. An emphasis on problem-solving within systemic contexts engages students in systems thinking and social analyses, and trains them to be better equipped to address complex and controversial problems (Jordan, Andow et al., 2005). Two examples of common formats for systems-based problem-solving in SAFSE include civic agriculture and community-based learning that focus on community-based renewal through locally-based food production (Wright, 2006). Wright explains how both formats engage students directly with community partners within the food system under study, creating a learning environment focused on social change. As stated by Moncure and Francis (2011), a main goal of such a learning community is to develop skills and competencies that encourage students to engage in responsible civic participation.

SAFSE evolved in response to a traditional educational context for agricultural education at Land Grant Colleges and Universities of Agriculture that were founded upon discipline-centered education through specialized departments consisting of particular research methods and language (Lieblein, Francis et al., 2000). This traditional perspective, critiqued by Freire (1970), is known as the *banking concept* of education, where students serve as receptors of knowledge transmitted to them by the knower. This approach leaves students with a gap between knowledge and action and with limited

skills for dealing with increasingly complex global situations (Lieblein, Francis et al., 2000; Parr and Trexler, 2011). SAFSE addresses this issue through educational reform that promotes action-oriented programs that shift the educational focus from teaching to learning and prepares graduates with skills for self-directed learning (Lieblein, Francis et al., 2000; Parr and Trexler, 2011; Galt, Parr et al., 2013). These ideas are in line with the progressive education movement wherein learning is based on knowledge construction that is contextually based and personally meaningful (Lieblein, Francis et al., 2000; Parr and Trexler, 2011). According to Francis and Carter (2001), “professionals involved in the design of such learning environments should be prepared to: 1) Introduce long-term objectives and strategies in sustainable agriculture, including concerns with current systems and specific management alternatives; 2) Design and test learning approaches, and provide opportunities to observe, practice, and evaluate these methods; 3) Organize participatory learning experiences, such as on-farm workshops, demonstrations, tours, and meetings; and 4) Evaluate the impact of project learning activities, and teach educators to use evaluation as an integral and ongoing part of the education process” (p. 74).

2.2.3. Action Research

Action Research (AR) is an approach to generating knowledge within a study setting while addressing societal problems, as it links theories of change with useful action within communities (Stapp, Wals et al., 1996; Herr and Anderson, 2005). This approach draws upon Geertz’s (1983) work on *local knowledge* in anthropology, which generates knowledge within a community study setting that addresses pressing needs.

The intent of the knowledge generation is to inform and guide practical judgments. AR results in outcomes such as professional development and community empowerment, depending upon the level (individual, organizational, or community) at which growth and development are targeted. The theoretical foundations of action research in education are grounded in the progressive movement stimulated by John Dewey's philosophy of experiential education, in which reflective thinking and human experience are central to the generation of knowledge (Stapp, Wals et al., 1996; Herr and Anderson, 2005). Kurt Lewin applied Dewey's philosophy by developing the methodology of action research (Herr and Anderson, 2005). Herr and Anderson explain that action research has gained its greatest acceptance in applied fields such as education, organizational development, and agriculture. It is based on the notion that "the people most affected by a social situation ought to be the ones evaluating it as well as empowered to take action to change it" (Stapp & Wals, 1996, p. 29). Lewin later applied the approach to education with Stephen Corey at Columbia University to help teachers and teacher educators use action research in schools, as there was an identified interest in preparing citizens for a rapidly-changing world (Stapp and Wals, 1994). He described a cyclical set of actions that comprise action research: concrete experience, reflective observation, abstract conceptualization, and active experimentation, which later were characterized by David Kolb (1984) as the experiential learning cycle (Koliba and Lathrop, 2007). More recently defined as "praxis", the action research process has been defined metaphorically as a "spiral," in which the simultaneous processes of evaluation, reflection, and action occur (Stapp & Wals, 1994, p. 29). The action research spiral has been described based on the following sequence of cycles: 1) Develop a plan of action to improve what is already

happening; 2) Act to implement the plan; 3) Observe the effects of action in the context in which it occurs; 4) Reflect on these effects as basis for further planning and subsequent action (Herr and Anderson, 2005).

2.3 METHODS

My study is represented by a course at the University of Vermont that comprised a short-term immersion program with a focus on food systems. (See Table 2.1 for a summary of course structure and Appendix A for the Summer 2013 syllabus.) Its context was central to understanding the relationships between course design, praxis, and outcomes-based goals for students, and it illustrates how this programming affected student development. It also allowed me to examine relationships between the participatory evaluative process of action research (AR) and course development. Specifically, my research addressed two sets of research objectives, one that addressed the ways in which this course approached teaching and learning about food systems and sustainability, and another that pertains to how the AR process affects course design and development in immersion settings and the value thereof. By conducting research in this learning environment, I wanted to situate it within the context of higher education's role in addressing the challenges of sustainability.

Table 2.1. Course Structure Summary for the Milk to Maple Immersion Course.

Region	Burlington and Winooski	Northeast Kingdom	Montpelier	Addison County	Franklin County
Site Visits	New Farms for New Americans; Vermont Works for Women; Intervale Center; Farmers Market; City Market Cooperative; Vermont Institute for Artisan Cheese	Center for an Agricultural Economy; Highfields Center for Composting; Jasper Hill Farm; High Mowing Seeds; Couture's Maple Shop; Claire's Restaurant; Hill Farmstead Brewery	Vermont Sustainable Jobs Fund; Vermont Butter and Cheese; New England Culinary Institute; Vermont Fresh Network; Vermont Agency of Agriculture, Food, and Markets; Hunger Mountain Food Cooperative; Local Agricultural Community Exchange; The Kitchen Table Bistro	Shelburne Farms; Shelburne Vineyards; Twig Farm; Cabot Creamery; Monument Dairy Farm; Maggie Brook Sugarworks; Middlebury College Dining Hall; Middlebury Cooperative; Vergennes Laundry; Fiddlehead Brewery; Vermont Folklife Center; Sheldon Museum	St. Albans Cooperative Creamery; Boucher Farm; Green Winds Farm; The Farm Between; Boyden Valley Farm
Required Readings	Albers, 2000; Meadows, 2008; Meadows, 1999; Kloppenburg et al., 2000; Heller & Keoleian, 2003; Pimbert et al., 2001; Vermont Sustainable Jobs Fund, 2011; Paxson, 2013; Mares & Alkon, 2011; Allen & Sachs, 1991; Parsons (ND)				
Suggested Readings	Trubek, 2008; Ayres & Bosia, 2011; Wirzba, 2004; Hewitt, 2011; Lovell et al., 2010; Food Chain Workers Alliance, 2012				
Assignments	Systems Paper, Investigation Paper, Journal Responses, Reflective Essay, Application Paper				
Presentation Topics	History of Vermont Farming Systems Thinking Implications of Dairy Policy on Vermont Dairy Farms Agroecology in Vermont Sustainability and Food Systems Vermont Farm To Plate Initiative Policy Presentation by Rural Vermont				

Research objectives for this study included: 1) to examine the relationship between curricular design of an immersion course focused on food systems and the principles and practices of sustainability education; 2) to analyze how action research

affects course development; and 3) to assess the value of action research for the purpose of immersion course development in food systems and sustainability in higher education. Based on these objectives, I: a) provide in-depth description of the course studied, b) analyze the relationships between this course and the EfS and SAFSE frameworks, c) analyze the relationships between participatory research and evaluation on curricular development; and d) describe practitioners' professional roles and stakeholder engagement in these participatory processes in order to assess the value of engaging in these processes in higher education.

There were five completed teaching cycles for the “Milk to Maple” course, which provided access to longitudinal data that is essential to participatory evaluation. The first two iterations of the “Milk to Maple” course that took place during March of 2008 and 2009, and the third, fourth, and fifth iterations took place during the summers of 2010, 2011, and 2013. These course iterations spanned a range from eight-to-ten days for the immersion portion of the course. Methods undertaken for this study include: participant observation and written field notes during the immersion portion of course; semi-structured individual and group interviews with students and faculty involved in this course; document review of student work, with particular attention to reflective postings and essays; and additional review of course documents (syllabi and meeting notes) that recorded course development. Based on these ethnographic research methods, I collected data for the course. (See Table 2.2 for course data collection). These data include: records written as memos and meeting notes that document course design and development; observational data collected in the format of field notes during pre-departure meetings, site visits and seminars; student work samples (with particular

attention to reflective postings and essays that integrated conceptual knowledge with experience); individual and group student interviews; and faculty interviews.

Table 2.2. Data collected and analyzed for the “Milk to Maple” immersion course.

Data Collected	Data Analyzed
Review of archival records	Notes from Reflective Writing Workshop (2008) Syllabi, meeting notes and vignettes (all years) Blackboard course site (2009-2013)
Participant observation	Site visits (all years) Seminars (all years) Reflective discourse (all years)
Analysis of student work	Reflective essays (all years) Blackboard postings (2009-2013) Systems papers (2010-2013) Inquiry investigation papers (2010-2013) Project proposals (2008-2009)
Interviews	Feedback session (2008) – 11 students Feedback session (2009) – 10 students Group interview (2009) – 6 students Feedback session (2010) – 10 students Individual interviews (2011) – 6 students Group interview (2013) – 4 students Faculty interviews – 2

Information from faculty course instructors contributed to question selection for the student interview guide (see appendix B). Interview questions were also informed by data collected from students’ reflective essays. Interviews took place within one year of participant experience with their course iteration. This allowed me to conduct individual and group interviews with NYU student cohorts at NYU so that I could detail their collective experiences with the course in depth. Student interview questions asked participants to provide their overall reactions to the course, in order to gain insight into how the course affected them cognitively, affectively and behaviorally. To do this, I asked them to share their ideas about engaging, influential, and valuable aspects of the course. I also asked them to share any new knowledge or application of skills acquired

from their participation. Then, I directly probed their reactions to course design elements, including: 1) pre-departure, 2) experiential learning, 3) food systems concepts, 4) reflective practice, and 5) assignments. I further asked them to describe what they had hoped to gain by entering the course and to describe how they had situated the course within their overall academic course of study. Interviews with faculty addressed the topics of educational design, pedagogy, and learning outcomes for teaching agro-food systems content, as well as their perceptions of student development in relation to these topics. They also focused on faculty perceptions of the participatory development processes employed. In line with the AR approach under study in this research, I concluded each interview with an open-ended request for suggestions or modifications for improving the course. In addition to interviews, feedback sessions took place at the end of the immersion portion of this course. These discussions were designed to review students' conceptual understanding of the regional food system studied and to elicit feedback that would inform the design of future course iterations.

Audiotapes and transcriptions from individual and group interviews, as well as analyses of student work associated with these courses, were triangulated with field notes from participant observation and course archives for an inductive analysis that aimed to: 1) document course development, 2) analyze relationships between course concepts and learning objectives, and 3) analyze pedagogical relationships between this course and SAFSE and EfS. Data were compiled and organized using selective coding strategies into major themes, through a grounded theory approach to content analysis. To begin this process, interviews, field notes, and reflective essays were openly coded through digital highlighting to determine a range of concepts that were grouped into conceptual networks

that determined key coding categories. This open coding strategy provided me with selective codes for use with the full range of data collected. From these codes, categories of similar concepts emerged that were used to develop research theory. This theory was then shared with course stakeholders to verify course development processes and to consider further testing.

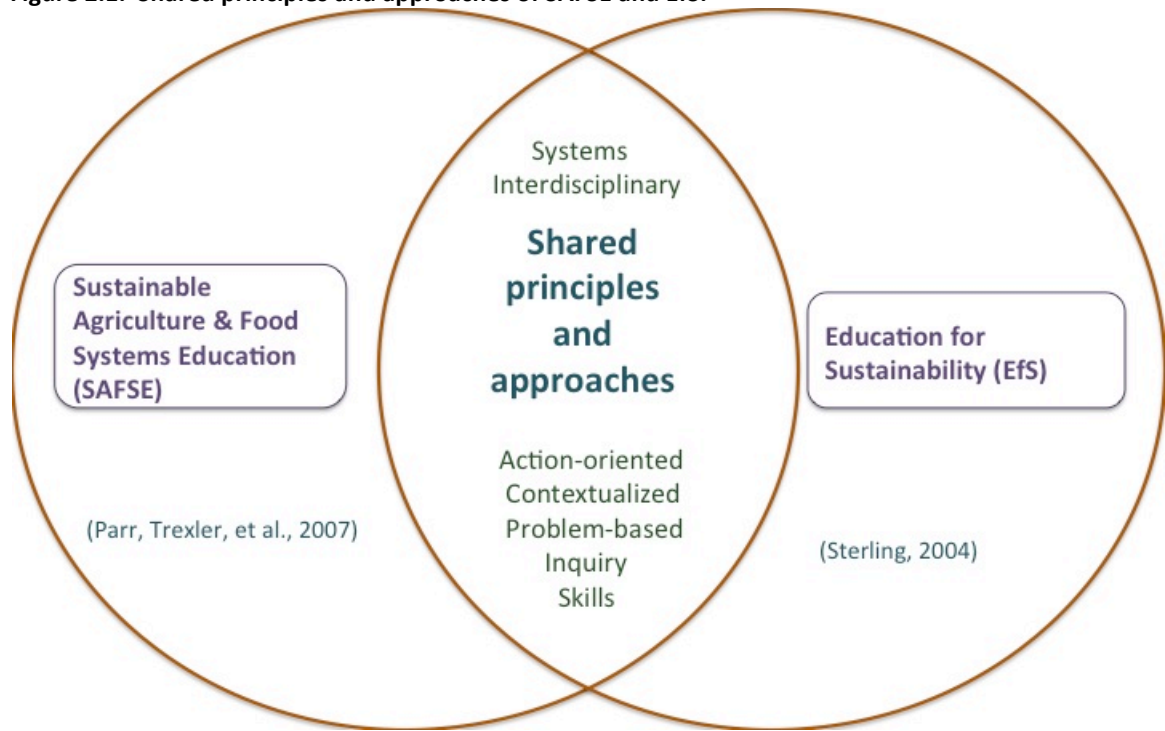
Limitations to this study include its small-scale nature, consisting of one course in one mid-size Land Grant University of Agriculture. Conclusions from this research may not be directly transferable to other food systems courses at other universities, and thus this research does not comprise directives for others designing food systems courses. However, based on the in-depth nature of the study and its rich, thick description, findings illustrate pedagogical concepts and evaluative processes that could benefit the design and development of similar courses and programs at other universities. An additional limitation to this study includes the potential for bias that exists based on my combined role as both course co-instructor and researcher. I have attempted to reduce bias through use of applied social research methods that reduce validity threats associated with my dual roles.

2.4. RESULTS

Through my participatory research and evaluation based on five iterations of the “Milk to Maple” course, I uncovered three core design and development themes that link key course concepts of sustainable agriculture and food systems with core course processes of systems thinking and reflection. The three core themes that emerged from

my study included: 1) Experiential Education, 2) Values and The Land, and 3) Systems and Sustainability. I describe the relationship between these emergent themes and the three common principles and practices of SAFSE and EfS: 1) experiential and action-oriented education; 2) contextualized and inquiry-based problem-solving; and 3) interdisciplinary and systems-based approaches to learning. (See Figure 2.1 for a visual representation of SAFSE and EfS overlap.)

Figure 2.1. Shared principles and approaches of SAFSE and EfS.



2.4.1 Experiential Education

Experiential learning (EL) was characterized by the student-centered and sensory experiences that enabled students to learn about the Vermont food system and its actors while touring regions of the landscape. Through written reflection, the NYU students involved in this course referred to experiential learning in terms of “things

you can only do in Vermont,” and used the sensory adjectives “palpable” and “tangible” to describe their experiences. Also indicated as powerful for learning were activities such as tasting maple syrup and learning how to describe those tastes (“buddy,” “tootsie,” “woodsie”) while learning about recent research in Vermont that focused on the relationship between taste and the place where the product was produced, i.e. “taste of place” or *terroir* (Trubek, 2008). Through discussion, students stated that their senses were implored to construct meaning from site visits. Specific activities identified included: “holding a goat,” “seeing cream separated from milk,” “observing employee working conditions,” and “smelling vats of milk in the creamery and noting labels on the sacks of dry milk powder.” These direct sensory experiences enhanced their learning about knowledge and skills-based processes connected to the Vermont food system. For instance, they learned about the ripening of cheese, the conversion of maple sap into syrup, how syrups are graded, and the application of varying technologies to achieve a cheese commodity of choice. Although not necessarily realistic for each site, students wanted to go further, so that they could actively “milk the goats,” “play with the cheese curds,” and “tap trees.”

This place-based immersion was comprised of inquiry-based processes to make meaning from authentic experiences. Student interview responses indicated that they valued the travel of their place-based immersion. They emphasized the importance of movement through the Vermont landscape for experiencing authenticity, which was described as an educational “agritourism.” The course approach was described as “memorable,” “real,” and “in the moment.” Across course iterations, timing and sequencing of site visits provided access to certain experiences and prohibited others.

For instance, students described snowshoeing through the landscape to see tapped maple trees as “powerful” for experiencing an “idyllic” Vermont; whereas, they missed seeing sap boiled and converted to maple syrup due to temperature requirements. Reflective essays, discussion, and interviews indicated that two-way communication between food system actors and students was key for student learning within these contexts. They indicated that local knowledge could only be gathered from interactions with those working in the system, and they gleaned this local knowledge through discussion, questioning, and observation processes. For instance, students discovered “barriers to knowing” at dairy facilities with larger scale operations. They described how they couldn’t see what was occurring in the milk at St. Albans Cooperative Creamery and at Vermont Butter & Cheese, and how they needed to delve deeper into questioning to discover the facts around what was occurring at these broader levels of scale within the food system. They described a need to look “a little harder for the facts” and to ask “good questions” to obtain information that helped them gain a realistic understanding of the system. Shared course experiences with food system actors outside of traditional academic contexts were powerful learning experiences because they deepened the students’ inquiry and provided insight into community values and agricultural practices.

Constructivism is a key element of experiential learning as it links new concepts and ideas to prior constructs in order to make meaning from experience (Moore, 2005). In transformative learning, it allows students to reconfigure frames of reference so that they align with personal development. Reflection was the primary way that students constructed meaning from their experiences. It allowed them to integrate new knowledge with existing knowledge and experiences in their fields of food systems and

food studies. It was described as a learning process that draws out important points or issues that had not previously been grasped or grappled with and allowed for expansion of ideas while experiences were fresh in the mind. Learning from others through discussion was a highly valuable learning format, particularly with the small size of each group. It deepened individual understandings of current issues to which they were being exposed, and it helped them synthesize content and organize thoughts for written reflection. In combination with a good facilitator to help tie concepts together, shared reflections helped them systematically and holistically understand the portions of the food system that they were exposed to during their stay.

An important aspect of constructivism in experiential education involves the application of new knowledge and skills to both abstract ideas and real-world scenarios. This course relied heavily on prior knowledge and experience of both participants and instructors to link new understandings to abstract ideas. The UVM Masters in Food Systems students agreed that the dynamic created by moving between concrete experience and theoretical discussion, or movement between the experiential and the more abstract, academic and less applied, was extremely valuable as it engaged them in multiple levels of learning, ultimately enhancing their understanding of the system. As confirmed by the lead instructor for early course iterations, the “constant dynamic between the concrete and the abstract...forces everybody to be accountable for different levels of learning.” From a facilitation perspective, course instructors indicated that the small class size provided them with opportunities to work with graduate students on more individual levels, where “thick” and “vexing” questions stimulated high levels of intellectual engagement and collective learning. Students described how this format,

combined with an applied assignment, allowed them to view practical applications of what had been reviewed earlier in their program studies. Its context thus bridged food systems theory with practice and brought depth to their ways of thinking about food systems. For instance, UVM students stated that they were able to apply new understandings to their more theoretical graduate and professional work in food systems. NYU students identified their abilities to find direct relationships between the rural agricultural sectors and their own urban lives, with one student pointing to site visits as a means for better understanding her Food Studies work at NYU. She went on to state that she would use this experience to both further her studies and to define her intellectual and career goals.

2.4.2. Values and The Land

The interconnected historical and geographical contexts of Vermont were shown to students through powerful stories—as seen through literature, art, and through personal interactions with food systems actors. For instance, the illustrated book, *Hands on the Land: A History of the Vermont Landscape* (Albers, 2000), selected as the primary text for this class, conveyed the history of agricultural systems on the Vermont landscape from the pre-settlement period to the present, largely through the stories it told through images and captions, with supporting text. The text was important for demonstrating the emergent growth of an environmental consciousness, supported by both public and private initiatives, that was grounded in community values associated with land stewardship. Having provided a solid background for students, they were then asked to conceptualize the current food system while touring the landscape. Student reflections

depicted how their course experiences, in combination with the text, provided a springboard for understanding current food system initiatives and activities, such as the rise of agritourism throughout the state and the Farm to Plate initiative (Vermont Sustainable Jobs Fund, 2011) that engaged government and business in supporting local food production and consumption, value-added processing, and farm diversification.

According to Marshall Ganz (2007) stories express values as lived experience. When they are place-specific, or *place-based*, this “gives power to the stories told” (p.1). Storytelling was the primary way that “Milk to Maple” students learned about values and the land. It served as the major pathway for building the imagery needed to understand the land and culture of Vermont, providing students with rich historical insight into the cultural values of Vermonters. Personal interactions with food systems actors fed these stories and expressed agrarian values, such as land stewardship, that drove people’s practices on the land. Students linked these values and philosophical beliefs to the historical use and cultivation of the land, particularly with reference to agricultural production systems, both past and present. The following five core values emerged from the stories told through rich and thick experiences, that were grounded in transparent interactions with food system actors: 1) land stewardship, 2) local foods, 3) brand identity, 4) social networks, and 5) innovation and sustainability. In this section, I describe each value as it emerged from the course.

Student reflections demonstrated that they discovered a theme of cultural pride and passion for the land that resulted in *land stewardship* and locally-based livelihoods. Students found that regardless of whether the people working within the system were “old” Vermonters or newcomers to Vermont, they upheld community values that sought

to “protect” and “preserve” the land and its inhabitants. Another student described how guides for each site visit were selected to represent and communicate their stories, and that these stories indicated to the audience a set of values that guide their operations. From these stories, students formulated impressions of Vermonters and Vermont organizations and their values. They came to understand how value-laden stories inform future land decisions, such as those associated with large-scale changes to Vermont’s economy, since community values continued to drive land practices. By interacting directly with Vermont producers, students felt that they better understood how current decisions are made in direct response to modern conditions, and how forecasts are made for the future of the land.

Stories told in Vermont expressed the value of *local foods* for the benefit of local economies for community well-being. Students indicated that the individuals they met held intense enthusiasm for their food system and expressed strong connections to their local foodways, regardless of whether they were born and raised in Vermont, or had selected Vermont as a place to embrace their ideals. Vermont’s expression of the local food movement served as an example of the alignment between values and action, as illustrated by students in all course cohorts through reflection. In line with the ideals of the national local food, or locavore movement in the United States, the concept of eating locally permeated food culture in Vermont. Students found that “knowing where your food comes from” was important to Vermonters. Capturing the ideas of fellow students, one individual reflection stated, “Local food has acquired a certain morality in Vermont. Eating local food is part of being a good Vermonter.” In the same way, a second student brought forth the idea that patrons of farmer’s markets felt less guilt about their

consumption patterns when their food could be traced to the producer. This value resulted in community support for local food producers who produced “fresh” and “sustainable” food. Students discovered that this commitment to local producers and processors resulted in many initiatives by public and non- profit organizations that are promoting the consumption, production, and distribution of locally produced foods. There was agreement among course participants that the Vermont food system is unlike others due to its high level of connection between producers and consumers and with regard to the efforts being made to provide local food to as many people in the state as possible.

A Vermont brand and its associated identity, or *brand identity*, linked students’ initial assumptions and developing impressions of an idyllic, bucolic Vermont—as known by its iconic scenery on maple syrup jugs—to community values that were reflected in community traditions and in perceptions of product quality. The Vermont identity and brand were further linked by students to a legacy of impoverished people on the land and to initiatives for economic revival. During the immersion, learning experiences consisted of stories and images that were shared by consumers who considered the Vermont brand. These consumers associated the concept of place-based products with values that surrounded “the pristine image of the farm” from which the product stemmed. As stated through one student’s written reflection, “the concept of the rural idyll is perpetuated for its commercial value, whether through images of the agrarian landscape on local food packages, promotional videos, and logos or by conversations that equate local with sustainable.” Similarly, a second reflection indicated that “place-based” as well as “place-processed” foods, such as chocolate, coffee, and

microbrew beer, that held the Vermont identity and brand, were associated with values connected to heightened cultural and environmental consciousness. An example of the brand identity value in action was illustrated through reflections on a thriving Northeast Kingdom (NEK) dairy farm that made efforts to bring their farm's brand and associated identity to local and international levels. They did this through their artisanal cave-aged cheeses, which involved collaboration with nationally-known Cabot to age a clothbound cheddar. Another student noted the progressive work of the Food Venture Center, a food processing facility in the NEK that supported small, local producers. She was highly interested in their work that utilized the Vermont brand to "capitalize on a market that is looking for food and products that feel authentic and meaningful." She described their work as experimental, testing the links between small scale food production and authenticity within the market economy. Current initiatives appeared to students to be an effort to differentiate Vermont's brand identity economically from competitors, particularly in the dairy and maple industries studied.

Students studied relationships and community networking to understand how *social networks* played into emergent economic endeavors within the Vermont food system. Stories indicated that social networks were representative of community values that involved supporting one another for the collective good. In addition to relationships between individuals and groups, community-based organizations were promoting such connections. Students experienced clear organizational dedication to local community as organizational actions fostered relationships, such as those demonstrated by the Vermont Fresh Network (VFN) and Shelburne Farms. VFN held a philosophy of identity preservation that supported farmer-chef relationships; whereas, Shelburne Farms stated a

mission to foster agricultural community by connecting people to their agricultural heritage and to the working landscape. Organizations such as LACE (Local Agricultural Community Exchange), and community food co-operatives, demonstrated their commitments to small, handcrafted producers from a local radius of 30-100 miles. A student reflection described how the director of LACE wove values of “responsibility” and “honesty” into the organization in order to incorporate these ideals into the community. In addition to individuals and organizations, government was identified as a proponent for strengthening Vermont’s food system, as agricultural policies worked to strengthen collaborations between organizations and to support statewide strategic planning. Overall, the idea of healthy communities was linked to the social capital and proximity of people and organizations working together to foster a sense of community.

Based on trends observed within the system, students found *innovation and sustainability* to be strongly held and linked community values. For example, as students interacted with an artisanal cheese producer at a small family farm in Northwest Vermont, they found that her artisanal cheese, as well as that of other small-scale producers, appeared to be “culturally valuable” and to “support community development.” She produced a high-end, highly marketable value-added cheese from a portion of the farm’s fluid milk. This example demonstrated a contemporary shift in a family business model that supported a family livelihood. Whether an individual’s role was as a high-end artisan cheesemaker, a chef instructor who utilized local ingredients, or a third-generation farmer who evolved his farm into an organic dairy with a maple shop and bed & breakfast, the students were impressed by their storyteller’s ability to positively transform the system. Students were also exposed to the evolutionary work of

small organizations, such as the Center for an Agricultural Economy and the Vermont Sustainable Jobs Fund, with a recent focus on achieving sustainability in local food systems. They found that many organizational decisions appeared to be based on agrarian values associated with conservation and preservation of natural and social capital, and references were made to the solutions-based creativity of such organizations.

2.4.3. Systems and Sustainability

The final theme, systems and sustainability, reflects what we learned about immersion course design for transformative learning in food systems. For instance, we learned that systems thinking and reflection processes served as core elements for meaning-making and that these processes successfully integrated with the concepts of scale, sustainability, and social movements to enhance student understanding. To begin this section, I provide a brief description of the major changes and trends that occurred across the iterations of the course's development; namely, the intentional incorporation of sustainability and food justice concepts into overall course structure. Then, I discuss the role of systems thinking as a tool for meaning-making throughout the course immersion, highlighting its strength when combined with reflections on varying economies of scale. I further describe the role of the nested Northeast Kingdom case within the broader Vermont case study, which provided insight into relationships between community values and sustainability. Finally, I address the role of reflective practice in combination with the study of food movements for making meaning from site visits. The study of social movements in conjunction with reflective practice demonstrates opportunities to address social justice issues associated with food access in Vermont.

This course was framed around three major themes for making meaning of the current food system of Vermont. Students were taught to utilize the lenses of systems thinking, sustainability, and social movements as they were exposed to a range of food systems sites and actors during their immersion. Initial course design highlighted systems thinking as the major route for meaning making, and sustainability was a thread that became more intentionally and purposefully sought and discussed as we moved through iterations of the course. Reflective activities provided space for discourse on the topic. Social and food justice themes emerged from written and oral reflection, like a low pulse, during early iterations of the course. Based on these remarks, the food justice concept appeared to be deeply important to few students and invisible to most. Over time, it became apparent to instructors that social justice should be explicitly highlighted with our student groups, and we began to consider its integration into course design in more meaningful ways. With the final study cohort, social movements were explicitly woven into the course to overtly address this need, providing a third lens for enhancing students' systemic understanding of Vermont's food system. For students in the UVM Master in Food Systems program, the three lenses of systems thinking, sustainability, and social movements helped bring places and ideas thereof into a systems perspective, rather than thinking about them as disparate systems components.

Systems thinking was identified through reflective writing as a useful tool for developing students' understanding of Vermont's food system. The use of Donella Meadows's systems thinking framework (2008) assisted their thinking about links in the food system while they developed conceptual ideas about the system that recognized issues and limitations. Numerous students had been exposed to Meadows's work on

systems thinking, yet these students indicated that it was different and profound to experientially learn about its implementation outside of the realm of academia. As stated through reflection, students employed a values-practice-structure framework for systems thinking that encouraged them to relate individual and community values to food systems practices. For example, students learned that people involved in production and processing within the system valued quality and obtained their knowledge, skills, and marketing from varying sources around the world—such as affinage for aging cheeses and brewmastering techniques from Europe. These students were captivated as they stood and listened to a farm owner explain his application of the systems thinking concept to his business model prior to hearing other cheesemakers, processors, and non-profit employees using similar terminology to describe their food systems work. Students also learned through concrete experience that involved them as interactive participant observers, engaging in inquiry and questioning with food systems actors. For instance, they viewed artisanal cheesemaking and donned snowshoes to view a network of tapped maple trees in order to learn about production practices and business models. Students learned that high-end value-added maple and cheese producers sell a majority of their high quality goods to nearby metropolitan areas in order to generate money from sales to benefit their local community. As described through student reflection, this framework aligned nicely with Meadows (2008) argument that actions often best reflect a system's true goals, more so even than its claims.

Student reflections indicated that they learned about economies of scale in Vermont via systems thinking processes. Written reflections and interviews indicated that visiting three levels of scale during a single day of dairy exploration was powerful

for understanding nuances and complexity within Vermont dairy. Comparing different scales was found to be of significant value to students from all cohorts as they were able to contrast the larger-size cooperative creameries to the artisanal cheese production of small family farms. As they studied various economies of scale, students were better able to understand how agricultural production decisions were made and to further juxtapose these realities alongside broader food systems issues associated with socioeconomics, class, and race. For instance, talking to the manager of a creamery enabled them to see how the larger-scale production facilities focused primarily on the economic bottom line rather than on the triple bottom line associated with sustainability. They also noted that the larger-scale producer/processor sites fed many more people in Vermont than the artisanal producers, which factored into their evolving ideas about sustainability and food justice. In contrast, artisanal cheese production models were not deemed feasible for feeding Vermont's public, yet they contributed to the overall food economy and provided commercial options apart from the large supermarkets of the industrialized food system. Interviews indicated that students believed that Vermont needs both the artisan and larger levels of scale to continue to support one another. They found that industrial production helped farmers find a market for their product. This had a ripple effect on smaller, artisan producers, by creating demand for Vermont products across the country. They interpreted the attraction and success of the Vermont brand as a contribution to local economies, stating that the smaller producers and organizations drove the recent trend in agritourism, whereas the larger-scale producers supported the broader economy. They recognized that both scales were complementary for a vibrant economy, and they described how economies of scale included unconventional business models that favored

social and economic opportunity over solely economic and scalar growth.

The town of Hardwick, in the Northeast Kingdom (NEK) of Vermont, served as a case study in sustainability for the final three iterations of the course. Students were given the option to read *The Town That Food Saved: How One Community Found Vitality in Local Food* and looked at the cultural, economic and environmental factors associated with the community's effort to revitalize its agricultural economy (Hewitt, 2009). This book looked at the active role of farmers and businesses thinking systematically about their role in their local food system. From this case study, students learned about change and innovation through food systems "agripreneurs" who built the numerous organizations that the students observed and interacted with during their stay (Hewitt, 2009, p. 82). Two main descriptors used by students included "creative adaptation" and "innovation" in response to increasing complexity and economic crises in the area. Students made specific reference to adaptation through the work of a thriving NEK farm, whose behavior producing and aging value-added, artisanal cheeses, reflected their need to adjust to "economic realities" of the region, while engaging in efforts to support the area's agricultural economy. According to one student, their state-of-the-art cheese caves created an environment "where small and large, conventional and organic, export and local consumption-based companies can co-exist." Although the farm's cheeses were not to be regularly found on the plates of Vermonters, a second student found them to be "an effective player" in the Vermont farming network, by channeling money from their high-end cheeses back into the community. In addition to these innovations and adaptations, this particular farm shared their vision to "seed" dairy farms in the area that could serve as consistent suppliers of milk to their business facility, thus

keeping struggling dairy farms afloat or providing a sales outlet for new producers to enter into dairy in that region. Overall, students found the NEK to be representative of the interconnected nature of small business throughout Vermont. As stated through reflection, the farms and organizations of the area “were all linked and interdependent and all used the Vermont story and brand to strengthen the economy of the region while utilizing outside capital.” A second student described Hardwick’s food system as “microcosmic of the entire Vermont food system,” expressing “a collective desire to steward the land and the economy.”

Prior to the purposeful integration of social movements into the course, students made references to food movements through reflective practice—namely to the localvore, organic, and farm-to-table movements. These reflections were made in relation to their course experiences. For instance, during early course iterations, food system explorations demonstrated that students were pondering Vermont’s role in the organic movement. They explored organic vs. conventional production practices. A farm in the Intervale in Burlington, Vermont, served as a good example of this investigation into organic food production. The Intervale farmer was quoted to have said, ‘Lots of organic farms do a lot of bad things.’ She explained that her farm was very dependent on plastic for their farming practices, and that this practice was “accepted and appreciated” regardless of its contradiction to their remaining environmentally sustainable and organic food production practices. From their experiences with the dairy sector, it was found that dairies did not equate organic with quality. Both medium and small dairies did not follow organic guidelines, and through these visits students realized drawbacks to organic production, including its cost prohibitive nature and certification rules that interfered with what was

considered to be good animal husbandry. In the NEK, students discovered a multiplicity of business ventures that made up the food system. Although they were very different organizations, they were found to have responded well to demands associated with the growing interest in social movements related to farming and food systems—namely, the local, artisanal, and organic movements—in their efforts to revitalize the agricultural economy.

For students interested in social justice, there was a sense that this course “celebrated” Vermont’s food system, while neglecting issues of food access. A non-traditional student, who was a long-time Vermonter, described his impression that fellow students didn’t understand the extent to which Vermont’s economy struggled with high levels of low-income families in small, rural areas. He perceived course discussion to revolve around issues associated with privilege, including topics such as organic and local foods. Another student stated through reflection, “believers in the Vermont model boasted that eating locally was good for the community’s health.” She felt that the course neglected to recognize that Vermont had been touched by the nationwide obesity epidemic, as numerous Vermonters were economically “shut out” of the food system based on poverty levels and food deserts in some of the rural areas. Similarly, for a third student, visiting zone four of Northern Vermont in springtime impressed upon her clear over-and under-nourishment issues associated with climate that were not being addressed in the course. She and other students wondered about the people who were “left out” of the food system, unable to afford fresh, locally produced meats and cheeses. These students struggled to make sense of the socioeconomic disparities associated with race and class, and how these issues were or were not integrated with progressive business

models in Vermont. Food justice themes primarily arose for students who had extended experience with Vermont. Although these voices were few, concerned students expressed awareness when they had not visited grassroots organizations working toward food justice. According to the lead instructor for the fifth course iteration who introduced students to social movements, the three lenses of systems thinking, sustainability, and social movements provided students with opportunities to look at systemic and integrated questions, such as those associated with immigrant labor and the role of ethnic populations in the food system. She found students' familiarity with the social movements theoretical framework to be underdeveloped and stated that it would be a rich area for further exploration.

2.5. DISCUSSION

EfS and SAFSE call for experiential, applied and community-based learning that are site specific and rely on integrating the social sciences with the natural sciences for an interdisciplinary understanding of natural systems in order to build a socially-engaged populus (Francis, Lieblein et al., 2001). Such contextualized learning through direct connections to farming and food systems provides interdisciplinary opportunities for students to apply systems thinking to their construction of knowledge and skills. (Lieblein, Francis et al., 2000; Francis, Lieblein et al., 2001; Wright, 2006). Based on the findings of this research that revolved around three major themes, there are clear links to be made between EfS, SAFSE and course development. The three key themes that emerged from this research include: 1) experiential education, 2) values and the land, and

3) systems and sustainability. For each of these themes, I analyze them in relation to the EfS and SAFSE frameworks. The first theme focuses on the role of experiential education in immersion-based food systems education. The second theme provides insight into the relationship between systems thinking and reflection processes and the food systems stories and community values that underlie behaviors of the system. The third theme focuses on the potential for food systems-based immersion courses to engage students in transformative learning that results in ecological worldview shifts that could better align their attitudes and behaviors with an orientation toward sustainability. I close this section with an analysis of the relationship between AR and curricular development within this course context, describing practitioners' professional roles and stakeholder engagement.

2.5.1. Experiential Education

Experiential education (EE) is essential to EfS and SAFSE. In this course, three areas of EE were uncovered that overlap with these two frameworks: 1) student-centered and sensory experiences, 2) authentic, place-based inquiry, and 3) constructivism as a tool for transformation.

The first area of overlap between these two frameworks was student-centered and sensory experiences. Such experiences are core to experiential education, which underlies both EfS and SAFSE. The student-centered and sensory experiences associated with this course connected students to agro-food systems concepts through civic agriculture, which includes on-farm education that ties community-based learning to interdisciplinary learning in integrated natural and social sciences for an enhanced

understanding of food systems (Lyson, 2004). Similar to the findings by Wright (2006), this study demonstrates that student engagement in civic agriculture highlights the relationships between agro-food system reform and the health and vitality of rural communities. Such community-based learning in SAFSE holds great potential to highly engage students and correlates closely to student learning (Ibid.) Galt, Parr, et al. (2013) point to learner-centered inquiries in food systems education as potentially transformative approaches to SAFSE when combined with reflective practice of a socially constructivist character. Given the small-scale nature of these immersion-based learning communities focused on food systems, more opportunities for hands'-on learning augments student learning and development. Combined with reflective practice, it provides a foundation for student-centered inquiry and problem-solving pedagogies that are often linked to real-world scenarios and to transformative learning in food systems.

In this study, the second area of framework overlap involved authentic, place-based inquiry that linked learning to an immersion in place. This site-specific application of experiential pedagogies provides context specificity that supports learning from and about systems complexity (Francis, Lieblein et al., 2001). Both EfS and SAFSE indicate contextualized and inquiry-based problem-solving as essential for transformative learning. In the case of experiential learning that addresses food systems and sustainability, students should be involved in inquiry-based learning that addresses complex problems within a regional foodshed, and further links students to food systems issues at broader scales. This idea is in line with those of Rittel and Webber (1973), who state that inquiry has the capacity to engage in the discourse around local to global issues, those which require personal and social transformation to address the “wicked problems”

of our era. To borrow language from David Kolb (2005), such authentic *learning spaces* recognize the interdependent nature of individuals and their environment, and influence their behavior within their environments. Students in courses that link sustainability and food systems need opportunities to engage in authentic learning spaces that build inquiry-based and problem-solving skills. One example of how such processes are being engaged in SAFSE is through the open-ended case study approach implemented by Francis et al. (2011). This approach involves students in community-based problem-solving within authentic contexts and targets problem resolution alongside course instructors and community partners. An important facet of this approach is its engagement in inquiry on emergent topics, wherein the pertinent questions and their possible answers are not identified prior to beginning the inquiry. Drawing from their study, this approach would benefit immersion-based food systems courses if applied to pre-departure, immersion, and re-entry components associated with the course. This would enhance not only the opportunities to use the process skills of science to glean information for systemic analysis, but would also link analyses to contextualized problem-solving of a local to global nature.

For the third area of overlap between EfS and SAFSE identified in this course, constructivism served as a primary tool for transformation, and it relied on reflection for meaning construction. Constructivism occurred by engaging students in discourse and reflection processes focused on these direct experiences. They engaged with knowledge and skills development, as they moved through Kolb's (1984) experiential learning cycle, that involve not only concrete experience, but also reflective observation, abstract conceptualization, and active experimentation. According to Moore (2005), courses that

involve students in these stages—via processes of inquiry, discourse, reflection and action—engage students in critical and self-reflection that hold potential for becoming transformative in nature. Sustainability is an essential topic for constructing meaning through discourse in immersion-based food systems courses. Facilitated discourse about sustainability and food systems purposefully links community values to current initiatives and innovation within the system. Reflective praxes further help students in these courses determine where food systems actors are attempting and succeeding at leveraging change within systems. Thus, linking experiential learning to sustainability discourse that involves multiple stakeholder views and perspectives helps students understand the complexity that exists within food systems, and further enables them to bring the issues inward so that they engage in critical and self-reflection on their own worldviews. This course format resounds with the ideas of Galt, Clark et al., (2012), who discuss the role of integrative learning in a values-based pedagogical approach to SAFSE. Through integrative learning, these authors state that educational outcomes include: multidisciplinary knowledge and skills, application of theory to practice in complex real-world settings, ability to employ varied and opposing points of view, and to comprehend contextualized problems and varying viewpoints thereof.

2.5.2. Values and the Land

In the “Milk to Maple” course, the Values and the Land theme comprised two links to the EfS and SAFSE frameworks. The first link involved fundamental systems thinking and reflection processes, central to both EfS and SAFSE. These combined processes served to make sense of the stories, values, and inherent meanings of the

behaviors that were expressed within the food system. The second link emphasized reflection as the core process for integrating immersion-based food systems learning into students' personal and professional spheres of life. Reflection was identified as crucial for targeting personal and social transformation when linked to students' academic lives and beyond.

Reflection is an essential process for experiential learning. Thus, reflection on values and action underlying the stories told throughout immersion courses serve as a major pathway for understanding current practices and initiatives occurring within the system. For students in immersion courses, these processes should be more directly joined to the interconnected concepts of sustainability and food systems. As students use them to make meaning of the experiential and textual stories and images observed throughout an immersion, and uncover the attitudes and behaviors of food systems actors, they learn to relate community values to efforts to positively transform the system. They study the ways in which these actors deal with complex challenges and systems limitations in their efforts to make change. In such a way, systems thinking and reflection on course experiences serve to support the development of problem-solving skills. Such skills development could be further supported in these types of courses as facilitators lead students through exploration of the underlying values and behaviors of broader food systems. Instructors would guide students through discourse around comprehensive systemic issues such as poverty, obesity, agricultural consolidation, and immigration.

A stated outcome for both EfS and SAFSE is to create an educated citizenry capable of tackling present day and forecasted world problems. Students in graduate-

level, well-executed immersion courses directly apply newly acquired knowledge and skills to their work within their nested academic program of study. They reflect on their course experiences in relation to their broader food studies and food systems programmatic goals, and some students apply new understandings from these experiences to their lives outside of academia. Thus, critical and self-reflection on course experiences needs to go beyond the one-week immersion to connect to students' professional directions in such a way that they can critically reflect on their own values, perspectives and behaviors. Critical and self-reflection on course experiences is essential for setting the stage for transformative learning, and transformative learning is the vehicle which propels students toward values and action that align with concepts of sustainability in food systems. Thus, through contextualized studies of the system, in tandem with effective facilitation on innovation and sustainability, students have greater opportunities to analyze varying perspectives and behaviors in relation to their own. Students can then utilize better-aligned perspectives and values for action-oriented values-based goal-setting. Topics of leadership and change should be linked to systems thinking and critical self-reflection, so that students have greater opportunities for action-oriented goal setting for themselves and for their communities. These leaders become the storytellers of the future. Boal and Schultz (2007) state that when stories are created, told and retold by strategic leaders, "the systems and processes of perspective making, perspective taking, and perspective shaping take on tangible form" (p. 420).

2.5.3. Systems and Sustainability

Systems and Sustainability are core constructs comprising EfS and SAFSE. The third thematic overlap in these educational frameworks addressed by this research is the role of interdisciplinary systems thinking for transformative learning in food systems. The use of systems thinking linked with sustainability concepts through immersion-based food systems courses engages students in powerful learning with potential for transformation of beliefs, values, attitudes, feelings and ways of thinking.

Case studies are effective tools for systems thinking in SAFSE as they center learning on both broad systems and key components (Lieblein, Francis et al., 2000; Francis, Breland et al., 2013; Hilimire, Gillon et al., 2014). In addition to their direct link to issues and multiple stakeholder views in authentic contexts, they allow for analyses of nested food systems at multiple scales, which enable students to determine trends within systems. For instance, students can address scale and innovation within a broader context of sustainability, linking systems thinking and sustainability concepts as students seek leverage points for effective change within and across scales. One recent and specific way in which SAFSE practitioners are moving in this direction is through the open-ended case study approach that engages faculty, students, and community partners in collaborative exploration of complex agricultural settings where neither questions nor answers are necessarily identified prior to their study (Francis, Lieblein et al., 2009; Francis, Jordan et al., 2011). This and other case study formats are deeply rooted in inquiry-based processes for analyzing systems.

Pedagogically, social movements work well as a way to think about systems, as they inherently encompass sustainability topics. Thus, the use of social movements as a

lens for studying systems offers the strongest link to weave both sustainability and interdisciplinary systems thinking into immersion-based food systems courses. Meadows (1991) explained systems in terms of their ability to share the “deep, socially shared ideas about the nature of the world” (p.2). In such a way, they clarify our stories, our values, and shed light on how values play out in our world day to day. Studying social movements via system thinking enables us to link the values uncovered by stories to social action within food systems. In this way, students learn to both celebrate and critically observe and reflect upon the shortcomings within the system. Looking closely at food movements both from a theoretical viewpoint and from an immersion-based practical viewpoint supports students’ meaning making of food systems concepts and practice. Mares and Alkon (2011) pointed to food movements as objects of study for targeting issues such as group marginalization, farmworkers’ rights and food access. These studies allow students to critique food movements in a more applied way. For instance, studying the topics of community food security, food justice and food sovereignty both theoretically and practically allows students to think about and observe their own roles in food systems and in systems transformation. Further, Moncure & Francis (2011) point to the utility of experiential education for examining power issues in society that are linked to transformative learning and are integrated into a holistic understanding of food systems and social justice. By studying food systems with the three lenses of systems thinking, sustainability and social movements, students are given greater opportunities for transformative learning that embodies the competencies and skills needed for social transformation, such as those associated with the development and understanding of varying perspectives within the system of study.

2.5.4. Course Development

Based on this study, I've identified four recommendations for immersion course development that are in direct relation to EfS, SAFSE and AR. These recommendations include: 1) use sustainability education frameworks for all systems-based courses focused on sustainability, 2) engage in professional development and networking in these related fields, 3) maximize the transdisciplinary focus of sustainability-related immersion courses, and 4) utilize AR to guide course development. Practitioners interested in developing immersion-based food systems and other travel-study courses focused on sustainability would benefit from using the EfS and SAFSE frameworks for their development. They would further benefit from using action research processes to frame an evaluation for their course—from problem recognition and plans for course improvement, to observation on its' implementation and reflection for future planning.

Immersion programs are challenging to design based on their short-term, intensive nature. Questions arise around academic rigor and effective forms of assessment for this type of learning. The iterative nature of AR can address these challenges by weaving purposeful reflection and problem-solving into course development processes. This requires that practitioners take an active researcher role while holding the shared EfS and SAFSE principles as guides for course development. While this study focused on a course where a food system was the object of inquiry, other types of systems-based courses (e.g. transportation, energy, waste and recycling, etc.) would benefit from similar design and evaluation processes. By combining AR with these sustainability education frameworks, practitioners from varied disciplines and backgrounds can follow similar course development processes, which would involve

frequent review of these courses alongside the frameworks.

Support for sustainability educators in higher education has become more common as institutional interest in sustainability has risen. This includes arrangements for team teaching, institutionalized professional development, and focused professional networks and associations. Team teaching is one instructional format that allows for cooperative practitioner reflection. Another reflection format involves practitioner participation in professional development circles such as “Critical Friends” that are effective for sharing pedagogical praxis knowledge in a collegial way (Bambino, 2002). Such collaborative approaches to professional development support efforts to clarify course objectives and refine the pedagogical praxes that best meet them. Further, immersion-based courses require the capacity of instructors to facilitate inquiry and reflection, both during the immersion and in relation to course evaluation. An ability to prompt, translate meaning, and facilitate dialogue is essential to these learning contexts and could be supported by such professional development networks. Professional networking through professional organizations is another way to gain support for pedagogical and evaluative praxes in immersion-based EfS and SAFSE. Professional organizations such as the Sustainable Agriculture Education Association and the Association for the Study of Food and Society are prime examples of professional networks working toward improved teaching and learning in sustainable food systems in higher education. In addition, higher education institutions have been dedicating resources to centers and programs focused on sustainability and food systems. Examples include the Center for Agroecology & Sustainable Food Systems at UC Santa Cruz, which engages in educational research on food systems, and the Sustainability Faculty

Fellows program at UVM that creates a multidisciplinary faculty cohort engaged in exploration of sustainability in teaching and learning. Practitioner engagement in professional collaboration, networking, and institutional programs focused on sustainability greatly enhance the capacities of instructors to develop systems-based immersion programs.

Unique to these course contexts is the opportunity to incorporate the knowledge and skills of faculty, students and community partners in inter-, multi- and trans-disciplinary ways to enrich teaching and evaluation efforts. Iterative evaluation for course development within immersion-based learning communities that involves these stakeholders should aim for transdisciplinarity. Nicolescu (2002) defined transdisciplinary as between, across and beyond all disciplines, with a goal of understanding the world through united knowledge. By engaging in reflective practice with varied stakeholders involved in these immersion-based courses, practitioners have greater opportunities to link multiple forms of knowledge to the pedagogies shared by the EfS and SAFSE frameworks for enhanced teaching and learning opportunities in sustainability education. These transdisciplinary efforts require commitments to similar educational and critical pedagogies that are foundational to sustainability education. With these efforts and commitments to EfS, SAFSE and AR, transdisciplinarity will be strengthened in immersion-based courses.

The first steps to immersion course development focused on food systems include establishing parameters for their contexts and developing learning outcomes. Community partners and site visits need to be identified early, as they help determine opportunities for problem-based learning and case studies, as well as for transdisciplinary learning.

Initial course development should weave the systems thinking, sustainability and social movements lenses into course design, as learning outcomes are considered and assignments are developed in relation to these objectives. Review of learning objectives alongside the shared principles of EfS and SAFSE helps with selection of pedagogies to target student learning. Selected pedagogies and associated assignments need to align with the three segments (pre-departure, immersion, and re-entry) of these courses. Reflective essay assignments are essential for immersion courses, as they serve as a tool for assessing student learning and for course development. While reflection is woven throughout the course immersion, essays should be submitted shortly afterward in order to deepen learning connections between course concepts and experience. Once a solid curriculum is built and pedagogical praxes are clear, course instructors can be changed. New instructors will bring new insights and make modifications to the course based on their involvement in its evolution through AR.

Leiblein, Francis, and King (2000) state, “On the broader systemic level of higher education, action-based research and education have potential to revitalize the future university learning environment, especially when coupled with reflection on the experience” (p. 219). In line with these ideas, immersion course evaluation should follow the steps outlined for the AR spiral, from plan development and implementation, to observation and critical reflection, in order to determine next steps for course development. As AR is experiential in nature, all course stakeholders (faculty, instructors, students, community partners, etc.) should be involved in its participatory evaluation format, so that they can contribute equitably to course development by informing and guiding practice. In this way, stakeholder interest drives course

development. This iterative process involves instructors in ongoing collaboration with colleagues and community partners, who become actively involved in both the teaching/learning and the reflection/evaluation aspects of these courses. These collaborative processes strengthen relationships between communities and university faculty engaging in these efforts, helping LGCA's meet community engagement goals. Ultimately, these efforts should achieve outcomes associated with professional development and active citizenship. These outcomes include enhanced teaching and learning in immersion-based food systems, and in other sustainability-focused immersion courses, and student preparation for active and democratic civic participation. Achievement of these outcomes supports goals associated with attaining sustainability in higher education.

2.6. CONCLUSION

There are subtle differences to be found between the comprehensive EfS and SAFSE frameworks. Both EfS and SAFSE place importance on a holistic model for education, grounded in interdisciplinary inquiry and systems thinking. The EfS framework maintains a broader scope for thinking about the implementation of inter-, multi-, and trans-disciplinary systems thinking and emphasizes their placement within the broad context of ecological systems. SAFSE holds a more specified focus on agro-food systems, yet it shares many of the same principles and practices as EfS. In the context of higher education, the major purposes for the EfS framework are to bring attention to learning focused on sustainability and to prompt educational reform that better aligns

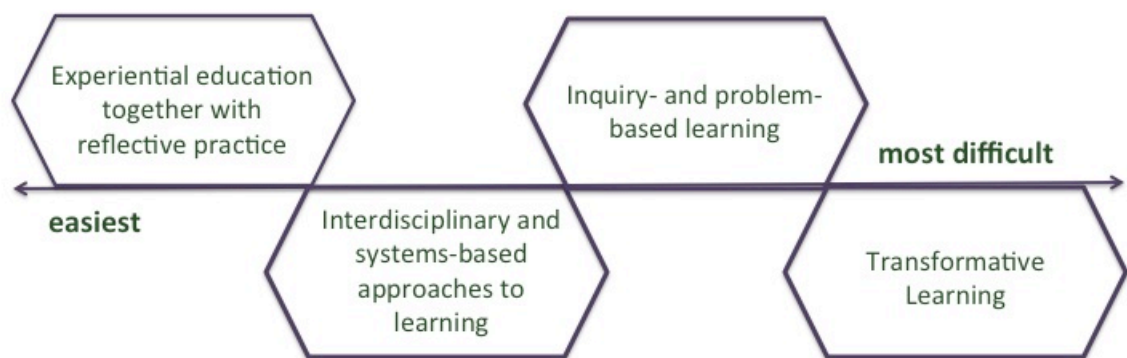
with sustainability. It seeks to do this through an educational focus on the interdependence of complex social, economic, and environmental issues and their resolution, and by shifting educational policy and praxis to better align with sustainability. The major purpose of SAFSE is to move away from the traditional instrumental and discipline-centric approaches to agriculture education. It does this by emphasizing the interdisciplinary integration of natural and social science methods and by utilizing multiple methods and scales of inquiry for making meaning of agro-food systems. Inquiry is integral to sustainability education and is integrated with problem-based approaches to learning. EfS denotes a broad range of possibilities for problem-based learning within communities, whereas SAFSE focuses on agro-food systems contexts that include on-farm teaching and research, student farms, and civic agriculture.

Both EfS and SAFSE introduce the concept of a broad learning community, wherein faculty and instructors serve as both co-learners and co-facilitators of knowledge. They work alongside food systems actors and organizations to enrich the learning environment with multiple worldviews and epistemologies in an effort to engage stakeholders in transformative learning. This student-centered learning draws away from the mechanistic transmission of knowledge from expert to student characteristic of traditional educational contexts. Rather, these student-centered contexts are comprised of an action-orientation and facilitated direct experiences. They include applied and community-based settings that integrate well with inquiry-based and problem-based learning and emphasize the essential role of facilitated reflection on these direct experiences. Together these principles and approaches are intended to guide students toward a holistic understanding of the world and provide them with strong analytical,

communication, technology, and leadership skills to become change-makers of the future.

When held in tandem, we see that EfS and SAFSE offer great potential to move the field of sustainability education forward. Through this research I found four areas of overlap between these two sustainability education frameworks, all of which may be connected to critical and self-reflection processes. These four principal areas of overlap include: 1) experiential and action-oriented education together with reflective practice, 2) interdisciplinary and systems-based approaches to learning, 3) inquiry- and problem-based learning, and 4) transformative learning. In response to my first objective for this case study, which examined relationships between the educational design of this food systems immersion course and the principles and practices of sustainability education, I offer a continuum of sustainability education principles from easiest to target and measure to most difficult to implement and measure. (See figure 2.2. Pedagogical Praxis Continuum for EfS and SAFSE.)

Figure 2.2. Pedagogical Praxis Continuum for SAFSE and EfS.



Experiential and action-oriented approaches have a long history and are expansive, from classroom-based pedagogies to a wide range of immersion-based learning formats. The experiential agritourism format for this short-term immersion course is passive in nature when compared to the range of formats for experiential learning that exist in higher education, yet it offers significant opportunities for experiential learning to occur that are not available through traditional, institutional courses offered at the graduate level of study. This study shows that the experiential education principle of sustainability education is the easiest to target and reach within this context because immersion courses are grounded in site visits and their associated inquiry. These real-world, contextualized experiences allow instructors to guide students in applications of theory to practice in authentic learning spaces. Authentic learning spaces for regional food systems studies consist of contextualized, place-based learning alongside community partners engaged in real-world work. This idea draws from Kolb's (2005) learning space framework that "recognizes the interface between student learning styles and institutional learning environment" (p. 193). Site visits provide a wealth of information for knowledge construction when lines of inquiry are formulated both ahead of time and also emerge during the course. One challenge for immersion-based food systems educators rests in providing students with sufficient background information that will help them develop good questions during immersion. The second challenge rests in sequencing course activities in an order that will best enhance student learning and development. Because real-world work is dynamic and community partner schedules are widely variable, these educators serve as the glue that binds course experiences in authentic learning spaces together with course concepts in a holistic way. Through

facilitated discussion based on these direct experiences, instructors lead students along the Perception Continuum of Kolb's Experiential Learning Cycle (1984), between Abstract Conceptualization and Concrete Experience. These processes should be closely tied to systems thinking, sustainability, and social movements frames for making meaning of the contextualized food system in relation to broader food systems at regional and international scales.

Interdisciplinary and systems-based approaches are becoming more common within the academy, both through teaching and research, so that they are more likely to be found within course offerings. Within an immersion-based course focused on regional food system case studies, it was a natural fit to engage students in systems thinking, using the theoretical iceberg model for understanding connections between values, practice, and systemic structures of the food system. Case studies within this immersion context consist of in-depth participant observation and guided inquiry within a region specified by a combination of social, political, economic, and agricultural boundaries. Within multi-scalar and nested food systems case studies, students engage as reflective practitioners who discover the values that drive systems behavior by listening to stories they hear as they tour a regional landscape. This stories-values-behavior framework melds nicely with the iceberg model for systems thinking that utilizes a values-practice-structure framework for understanding broader food system issues. By working with these overlapping systems thinking frameworks to address multiple food system scales, students have greater opportunities to connect real-world experiences to broader issues. Further, the study of social movements in the context of this course type links systems thinking with sustainability topics. The role of facilitated discussion by

faculty around food justice topics associated with the small-scale, rural sector is key to making connections between the two frameworks. By engaging these course attributes, transformative learning may be targeted within these courses, through: a) contextualized food systems analyses at varying levels of scale, b) intentional integration of systems thinking with sustainability and social movements topics, and c) explicit study of food movements.

Through this course format, faculty instructors address: 1) assumptions and misconceptions, and 2) tensions that underlie course experiences in authentic learning spaces. Students bring assumptions and misconceptions to the course, whereas others emerge during the course. Guided facilitation can help instructors bring these ideas to the forefront of discussion so that students become aware of their collective perspectives. Instructors can also relate students' assumptions and misconceptions to overarching food systems issues. For instance, this regional case could be compared to other cases of similar scale in other regions of the U.S wherein similar assumptions and misconceptions would occur. This type of comparison could be telling in terms of teaching and learning about systemic issues, particularly when combined with the iceberg model for systems thinking that studies trends, patterns, and systemic structures underlying systems. In addition, underlying class and ethnicity tensions that emerge through this course context connect closely to differences in privilege that exist between students, between students and community partners, and between the range of community partners who participate in the course. These differences mirror those of broader American society. They are often connected to the assumptions and misconceptions held by privileged student groups as well. Guided reflection around concepts of food affordability, access, and privilege

should thus to be interwoven into this course, as these concepts address complexities of broader food issues worldwide. In such a way, students can be directed toward enhanced understanding of underlying systems complexities associated with the interrelated economic, social, and environmental aspects of food systems and The Triple Bottom Line of social, environmental and economic justice. On the level of action research, this study indicates that instructors need to work together to identify common assumptions and misconceptions that emerge during course iterations in order to better prepare themselves to address them within their course context.

Inter-, multi-, and trans-disciplinary approaches for understanding the world through united knowledge enrich teaching and evaluation efforts within these contexts by generating space for equitable contributions from each stakeholder group to these processes. These approaches can engage all course stakeholders in reflective practice that involves multiple stakeholder views. More intentional emphasis on inter-, multi-, and trans-disciplinary pedagogies that involve community-based learning offers opportunities for students to share what they learn with community partners in ways that resemble ethnographic validity checks. This offers enhanced opportunity to gain feedback from community partners about what was observed, how it was analyzed, and about emergent food systems theory. Course designers are challenged to embed these approaches in ways that both enhance the educational environment and involve stakeholders as responsive action researchers interested in course and program improvement.

Inquiry- and problem-based learning modalities that influence transformative learning are the most challenging to design, implement, and assess. These modalities

have great potential for engaging students in transformative learning, yet they require a great deal of effort to design and implement, and are often challenging to evaluate, particularly when the questions of inquiry and the outcomes of problem-solving processes are unknown to begin with, as in the open-ended case study approach to learning in food systems. As a result, they are often left out of the pedagogical mix that makes up immersion courses. As sustainability educators design and evaluate new models for food systems education that aim for educational transformation, it is important to consider these principles and combine them with the essential role of reflective discussion for transformative learning within these contexts. Thus, it is crucial that instructors facilitate reflection on inquiry-based and problem-based direct experiences in ways that draw out key food systems points, expand upon new and existing ideas about the food system, and support the socially constructivist nature of group learning. In addition, inquiry-based and problem-solving processes should target topics of leadership and change with students so that they can envision themselves as food systems change-makers, who have been offered contextualized experiences for envisioning real-world systems-based work and apply their learning to thinking toward the future.

This course format links sensory and place-based experiences to an ethnographic exploration of a regional food system, offering graduate-level educators the opportunity to explicitly link inquiry-based learning to research skills concepts and development. Course activity that involves students in participant observation and collection of field notes through this course context could be linked to a more formal ethnography. Although brief, an ethnography that spans pre-departure, immersion, and re-entry could offer insight into real-world research. Guided reflection could create space for discourse

addressing coding processes for determining emergent themes that could then be linked to further research inquiry. These processes could further be connected to a research assignment associated with a re-entry segment that directly follows course immersion. Students could develop food systems theory and propose further research based on emerging themes that would allow them to consider more empirical testing within the system. Or, instructors could design portions of the course to incorporate lines of inquiry that guide students toward community partners who offer information for their study. The short-term nature of this course would create challenges to such a model, yet the iterative nature of action research could support course development that addresses such challenges. This adds a layer to the learning environment that would support students not only at the course level, but also at the academic program level, as they gain more experience with research processes. Further, a facilitated ethnographic inquiry would help students make connections between course experiences and applied graduate research projects so that they are making connections between course concepts and processes and real-world research in the field of food systems.

My second research objective intended to assess the value of participatory research and evaluation for course development. In response to this objective I found that the iterative nature of AR that leads stakeholders through processes of planning, acting, observing, and reflecting, can address design challenges by weaving purposeful reflection and problem-solving into course development processes. These processes draw on the knowledge and expertise of faculty instructors, who can effectively integrate them into the course structure. In this case, both lead instructors are anthropologists by training, yet their unique research interests and activities in food systems shifted the focus of the

course. Others interested in developing similar courses would benefit from linking their interdisciplinary research focuses into course development processes. Further, this study suggests that other graduate level programs in food systems may want to utilize sustainability education frameworks for course design and evaluation. Within the travel-study genre, where immersion courses are often housed, this sort of analysis could be brought to another course focused on another topic, such as political ecology, in another region of the world. Similar to this study, such courses would benefit from frames that link experiential education to values, systems, and sustainability. Thus, practitioner-researchers from varied disciplines can follow similar processes, involving frequent review of courses alongside EfS and SAFSE frameworks. Although we've begun to develop a framework, it would be interesting to see other educators take what we've begun and try AR in their own settings to see what concepts and strategies emerge.

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CHAPTER THREE

CAFÉ EN TACUBA: COFFEE ECOLOGIES AND LIVELIHOODS IN A SHADE COFFEE LANDSCAPE OF EL SALVADOR

3.1. INTRODUCTION

The growing field of agroecology education studies the relational effects between humans and agroecosystems, placing “emphasis on eco-social feedbacks and systemic analyses” (Jordan, Andow et al., 2005, p.83). The field has grown in juxtaposition to sustainable agriculture and agro-food systems education, which shares many of the principles and approaches of sustainability education (Parr and Trexler, 2011). As institutional interest in sustainability increases, innovative programs are showing how the integration of sustainable agriculture and sustainability education can yield positive results for teaching and learning content in both of these thematic areas. Innovative curricula in agroecology that focus on sustainable agriculture and agro-food systems provide engaging topics and contexts through which to teach and learn about contents of interest for sustainability education, including environmental, social and economic issues. This makes it an interesting field to analyze in terms of the similarities to and differences from when compared to sustainability education. In addition, and perhaps more importantly, is the notion that the evolving curriculum in sustainable agriculture and agro-food systems can be one of the most efficient vehicles to teach sustainability education to students from a variety of majors. As all students consume food, it is possible to contextualize these topics in a way that relates to a diversity of students

(Galarneau, 2007).

Results from the National Study of Student Engagement indicate benefits associated with college student participation in “high-impact” educational activities (Brownell and Swayner, 2009). Kuh (2008) describes greater gains in learning and personal development of students who engage in the following high-impact educational practices: learning communities, service learning, study abroad, student-faculty research, and senior culminating experiences. In an era that demands increasing accountability for resources, it is important for higher education institutions to demonstrate the impact of such activities, and to identify areas for continuous improvement, through measurements of student learning, retention, and service to local, campus, regional, national, and international communities (ACUHO-I., 2009).

Drawing on educational research in high-impact learning, I integrate the study of four high-impact practices with the burgeoning field of agroecology education. My study focuses on an undergraduate immersion course focused on agroecology and rural livelihoods of small-scale coffee farmers in Western El Salvador. By studying the integration of agroecology education with high-impact practices for the purposes of student learning and development, I share novel ideas around best practices for immersion course design and development in the field of agroecology.

3.2. LITERATURE REVIEW

3.2.1. Agroecology Education

With the passage of the Morrill Act of 1862, Land Grant Colleges and

Universities of Agriculture (LGCA) were founded in the United States, moving higher education away from a liberal education focus to a focus on agriculture education. As a result of this shift, the study of agriculture morphed from two-year practical degrees with field-based experiences into distinct disciplines (eg. entomology and agronomy) that were arranged into departments and majors with their own language and culture (Francis, Jordan et al., 2011). These authors describe a higher educational shift that resulted in a sustainable agriculture education movement that began to develop in LGUA over a century after their founding. This movement, occurring in the 1990's, was led by university faculty with international experience in developing countries that embraced student-centered learning. It coincided with research on undergraduate education that pointed to the need for interdisciplinary learning that is inquiry-based and socially engaged (Parr and Trexler, 2011). Challenges associated with this proposed shift included concerns that systems-based agriculture education would detract from in-depth, discipline-centric education required for undergraduate academic degrees (Francis, Jordan et al., 2011). A decade later, the National Research Council released, "Transforming Agricultural Education for a Changing World," that further pointed to the need to improve curricula and pedagogy for students studying in agriculture, environment, and life science-related fields in order to build a workforce prepared to meet community needs (Parr and Trexler, 2011). These research pursuits aimed for educational reform that would advance teaching in LGCA research institutions so that graduates would be prepared to face present-day world challenges.

The field of agroecology developed as an alternative to scientific disciplines supporting industrial agriculture (Mendez, Bacon et al., 2013). During its development,

it was largely understood as an application of ecological principles to agricultural production, focusing on factors determining production and associated environmental impacts at small spatial scales (Jordan, Andow et al., 2005). These authors describe how more recent, comprehensive conceptions of agroecology broaden the scope of inquiry beyond field production to include distribution, consumption and waste, as well as pressing human factors. The most recent evolutionary progress of the field—from a science, to a practice, and involving social movements at international scales—has augmented this field so that it holds potential to embrace extensive, multifaceted, interrelated sets of biophysical and socio-economic dimensions of food systems (Francis, Jordan et al., 2011).

Pedagogical models have been proposed for the newly-extended view of agroecology that consider humans as integral to agroecosystems (Jordan, Andow et al., 2005). These pedagogical approaches include: 1) learner-centered instructional strategies that lead to capacity for responsible action; 2) interdisciplinary- and systems-based studies of agroecosystems for development and management; 3) collaborative problem-solving for transformation of both agricultural and human systems; and 4) critical discourse encompassing differing worldviews about agricultural development (Jordan, Andow et al., 2005; Jordan, Bawden et al., 2008). Innovative educators and curriculum planners now accept the value of systems thinking within the field of experiential agroecology education. According to Francis, Jordan, et al. (2011), a systems approach to study agroecology across disciplines provides students with important competencies they will need in order to deal with complexity and uncertainty in the future. It also involves students in exploring roles, norms and values associated with power, with

potential for worldview transformation and social change relevant to sustainable development (Jordan, Andow et al., 2005; Jordan, Bawden et al., 2008). Through engagement with these approaches, instructors create learning spaces where students work in combination with instructors and clients to develop responsible action skills and prepare students to address multifaceted and contentious problems, enhancing civic dimensions of their professional lives and work (Jordan, Andow et al., 2005; Moncure and Francis, 2011).

3.2.2. High Impact Educational Practices (HIEP)

In the Association of American Colleges & Universities (AAC&U) 2007 report, *College Learning for the New Global Century*, the National Leadership Council for Liberal Education & America's Promise (LEAP) identified eight innovative, "high impact" practices that are gaining increased attention in higher education (Brownell and Swayner, 2009). High-Impact Educational Practices (HIEP) feature teaching and learning practices that have shown to be beneficial for college students from multiple backgrounds. They include first year seminars and experiences that link students to staff through common intellectual experiences, learning communities that connect two or more courses, undergraduate student-faculty research, study abroad, service-learning, internships, capstone courses and senior culminating experiences (Kuh, 2008). In 2008, Swayner and Brownell completed a literature review for AAC&U, researching the proven outcomes of five "high-impact" activities: first-year seminars, learning communities, study abroad, service learning, and undergraduate research. Of these five practices, the first four have gained considerable attention and have been promoted throughout the

educational research literature (Brownell and Swayner, 2009). Brownell and Swayner suggest that beyond the standard measures of academic success, i.e. GPA and retention rates, there are an array of behavioral, attitudinal, and learning outcomes advantages associated with HIEP that result in increased critical thinking and writing skills, broadened worldviews and appreciation for diversity, and higher levels of engagement in college. Four of the five HIEPs reviewed in 2008 are relevant to my study. They include study abroad, learning communities, service-learning, and undergraduate research. These four HIEPs will be reviewed individually in greater detail before they are analyzed together within the context of my study.

The first HIEP relevant to this research is study abroad (SA). Early studies of the impacts of SA indicate that personal development occurs as a result of having to cope with change and solve problems (Jacoby and Associates, 1996; Gmelch, 1997). According to Jacoby and Associates (1996), conditions for personal development include a readiness from within and stimuli that challenges the person psychologically, as well as a balance of trial and support for development to occur. As a result of this stimulation, individuals acquire new understandings about culture and themselves as they adapt to changes within their situations and environments (Gmelch, 1997). Gmelch found that study abroad students learn about the people and places visited, and to navigate the local systems within which their courses are embedded. He further described how this requires them to learn about culture and to acquire communication skills in order to meet personal needs, including safety. The type and duration of the experience were found to be significant variables associated with impacts of SA (Landis, Bennett et al., 2004). Their initial studies on intercultural experiences found that the optimal time for the experience

should be 3-12 months, and short-term programs were not found to have lasting psychosocial impacts due to low levels of interaction, intellectual engagement and cultural learning. However, other studies show that short-term SA increased self-confidence as well as adaptability, flexibility and communication skills that were linked to increased capacity for problem-solving and meeting individual needs (Gmelch, 1997; Landis, Bennett et al., 2004). One-time and short-term service-learning experiences within SA can be foundational for engaging students in the following: community exploration, connections with peers to accomplish something meaningful, learning about themselves via reflection, identifying possible service activities with community partners, and encouraging students to take further action or to focus their program of study (Jacoby and Associates, 1996).

The second relevant HIEP is participation in Learning Communities (LC), often a structural response to disciplinary fragmentation (Gabelnick, MacGregor et al., 1990). LC intentionally link courses or restructure curricula to increase opportunities for students to experience integrative learning around an overarching theme, while interacting on greater levels with peers and instructors through low faculty-student ratios (Gabelnick, MacGregor et al., 1990; Brownell and Swaner, 2009). Zhao and Kuh (2004) describe how LC operationalize the socially constructivist nature of learning, so that students and instructors engage in reciprocal learning processes, resulting in learning that is more profound and personally relevant. Such active and collaborative learning approaches, including team teaching, are linked to interdisciplinary themes that offer exposure to varying perspectives (Gabelnick, MacGregor et al., 1990). These distinctive environments help students develop a broad array of intellectual and social skills,

including: writing, speaking, critical thinking, group processes, problem-solving—as well as tolerance, inclusion and responsible citizenship (Gabelnick, MacGregor et al., 1990; Brownell and Swaner, 2009). They are linked to multidisciplinary knowledge and complex problem-solving in combination with experiential learning and reflection, as they provide a foundation for students and faculty to engage in interdisciplinary work alongside community partners (Reynolds, Brondizio et al., 2010). The result is an academic community that reduces the isolating tendencies of education connected to compartmentalized knowledge, and supports the integration of learning with the development of cooperative values and broadened worldviews (Gabelnick, MacGregor et al., 1990; Zhao and Kuh, 2004).

The third HIEP is an experiential pedagogy that integrates learning with service by engaging students in an academic course or program in meaningful structured activities that address human and community needs while promoting student learning and development (Jacoby and Associates, 1996; Brownell and Swayner, 2009). These authors describe how faculty, students, and community partners collectively determine the needs to be addressed and what is to be learned, with goals for service and learning seen as equally important. They further define the wide array of goals (eg. academic, individual, community, multicultural, vocational, or ethical) of service-learning (SL), and indicate that associated learning and developmental outcomes are not necessarily connected to a discipline or to course content. Its experiential nature leads students to think about real-world problems and issues, about their roles in these issues, and about what it means to be a community member outside of college (Kuh, 2008). It promotes learning about broader social issues, and helps stakeholders understand the values that

underlie these issues so that they recognize the socially constructed nature and causes of social inequities (Jacoby and Associates, 1996). It further allows students to apply interdisciplinary knowledge to these complex, real-world problems (Jacoby and Associates, 1996; Reynolds, Brondizio et al., 2010). While experience is the basis for SL, it is the transformation of experience into knowledge through structured, critical reflection supervised by faculty and tied to the curriculum that distinguishes it from other community service or volunteerism activities (Kolb, 1984; Jacoby and Associates, 1996; Kolb and Kolb, 2005; Brownell and Swayner, 2009). In addition to the ability to apply curricular learning to real-world conditions, studies show that SL correlates with gains in educational and civic outcomes, including: moral reasoning, a sense of social and civic responsibility, development of a social justice orientation, and an increased commitment to pursuing a service-oriented career (Kuh, 2008; Brownell and Swayner, 2009). According to Brownell and Swayner (2009b), SL should be paired with other HIEPs to increase gains for students, and they point to learning communities as a place that offers sufficient time and space to implement SL and to reflect on their work in multidisciplinary ways.

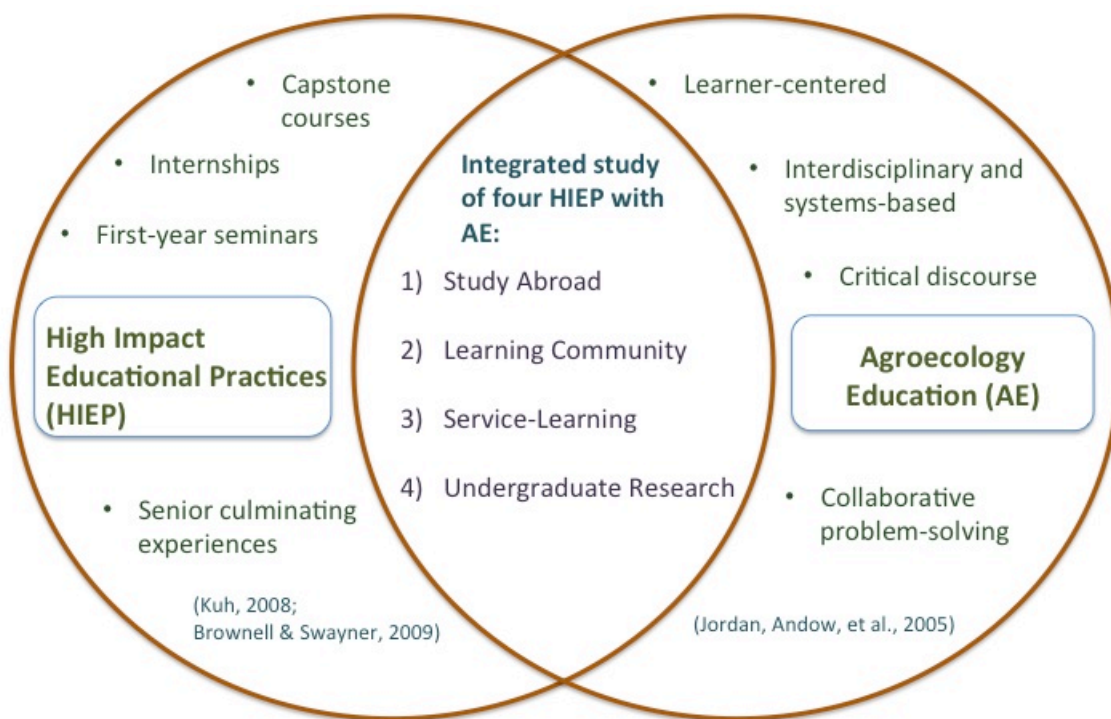
The fourth HIEP relevant to my study is undergraduate research (UR). In the literature to date, UR refers to individual projects undertaken in collaboration with, or with supervision from, a faculty mentor (Brownell and Swayner, 2009). According to these authors, UR often targets underrepresented students in order to encourage and prepare them for graduate studies. According to the AAC&U report, *College Learning for the New Global Century*, there is now greater support from the National Science Foundation and broader research communities to help faculty scientists redesign their

courses to connect core concepts and inquiry with student involvement in research (Association of American Colleges & Universities, 2008). This report indicates that through their efforts, the scientific community aspires to prepare students to tackle 21st century problems through experiences that involve questioning, practical observation, innovative technologies, and building enthusiasm to engage in science as a means to answer key questions. It states that these efforts are part of a movement in higher education to make experiences with research available to students in all disciplines. Their studies suggest that faculty balance challenge with support through their mentoring relationships, and that they offer opportunities for applied projects that include publications and presentations that will prepare students for graduate school. Studies further show that those who participate in UR are more likely to: a) show increased interaction with faculty, b) indicate higher levels of satisfaction with their college experiences, c) exhibit enhanced research and problem-solving skills, and d) attend graduate school (Brownell and Swaner, 2009a; Brownell and Swayner, 2009b).

3.3. METHODS

The major research objective for this study involved an examination of the relationship between curricular design of an international immersion course focused on agroecology and livelihoods and the four aforementioned HIEPs. (See Figure 3.1 for a visual representation of this case study.) Based on this objective, I provide in-depth description of the course studied. I further analyze the relationships between this agroecology course and these educational pedagogies outlined as HIEP.

Figure 3.1. Café en Tacuba Case Study Description.



My study concentrates on the learning outcomes of a course at the University of Vermont that comprised a short-term international immersion program with a focus on agroecology and rural livelihoods of small-scale coffee producers of Western El Salvador. This context was central to understanding the relationships between course design, praxis and outcomes-based goals for students, illustrating how programming affected student development. Specifically, my research addressed the ways in which this course approached teaching and learning about agroecology and livelihoods through its use of high impact educational practices. By conducting research in this learning environment, I wanted to situate it within the context of agroecology education at a land grant institution of higher learning.

There were three completed teaching cycles for the “Café en Tacuba” course. I was involved as a researcher and co-instructor for this course during its second and third iterations (Winter Sessions 2009 and 2011). The structure that prepared students for the 10-day winter immersion involved an application process open to them early in the fall semester. Once students were selected, they met with instructors three times to address course concepts, processes, policies and logistics to form a proto-learning community. This arrangement provided a foundation for increased interaction between students and faculty instructors, as well as between students, within this LC. They gained information about one another, instructors, and community partners involved in the course. The immersion portion of the course was structured by an itinerary of daily activity that was followed by facilitated reflection each evening. (See Table 3.1 for a course structure summary.) The 2011 course was followed by a one-credit spring reflection seminar that supported students through assignment completion and provided more depth for course inquiry and for service-learning activities. (See Appendix C for the 2011 course syllabus.)

Table 3.1. Course Structure Summary for the Café en Tacuba Immersion Course.

Itinerary Date	Itinerary Place	Itinerary Activity	Agroecology Concepts	HIEPs (SA, LC, SL, UR)
Tues, Jan 4	San Salvador, El Salvador	Botanical Garden	Tree identification and research	SA/ LC
Weds, Jan 5	San Salvador, El Salvador	Anthropology Museum	History and culture of coffee farming	SA/ LC
Thurs, Jan 6	Apaneca, El Salvador	Canopy Tour/ Coffee Processing Plant	Shade types and coffee processing	SA/ LC
Fri, Jan 7	Tacuba, El Salvador	Agroecology Hikes	Agroecological management	SA/ LC/ UR
Sat, Jan 8	Tacuba, El Salvador	Tree biodiversity and farmer livelihood data collection	Participatory Action Research (PAR)	SA/ LC/ UR
Sun, Jan 9	Tacuba, El Salvador	Coffee Harvest	PAR	SA/ LC/ SL/ UR
Mon, Jan 10	El Imposible National Park	Hikes/ Museum	Natural Forest Buffer Community	SA/LC/UR
Tues, Jan 11	El Imposible National Park	Hikes	Natural Forest Buffer Community	SA/LC/UR
Weds, Jan 12	Coatepeque Lake	Course Synthesis Discussion	Agroecology and Rural Livelihoods	SA/LC/SL/UR
Thurs, Jan 13	San Salvador	Final Reflection and Re-Entry Preparations	Agroecology and Rural Livelihoods	SA/LC/SL/UR
Daily (Jan 6-11)	Jardin de Celeste Conference Room	Reflective Discussion	Agroecology and Rural Livelihoods	SA/LC/SL/UR

Qualitative research methods undertaken for this study include: participant observation and written field notes, semi-structured individual and group interviews with student participants, and review of course planning documents and student work. Based on these ethnographic research methods, I collected data for the course. (See Table 3.2 for course data collection.) Data collected for both course iterations included: review of archival records consisting of meeting notes and memos that document course design and development; observational data collected during pre-departure, re-entry, daily immersion activities and reflective discussion; review of student work (with particular attention to reflective essays and postings that integrated conceptual knowledge with experience); and individual and group interviews. These data were inductively analyzed

to provide evidence for my research findings.

Table 3.2. Data collected and analyzed for the Café en Tacuba immersion course.

Data Collected	Data Analyzed
Review of archival records	Syllabi, meeting notes and vignettes Blackboard course site (2011)
Participant observation	Pre-departure meetings Daily immersion activities Daily reflective discourse Re-entry reflection seminar (2011)
Analysis of student work	Reflective essays Interdisciplinary field reports Blackboard postings
Interviews	Group interview (2009) – 6 students Individual interviews (2009) – 4 students Group interview (2011) – 10 students Individual interviews (2011) – 6 students

Information from the lead faculty course instructor contributed to question selection for the student interview guide (See Appendix D). Interview questions were also informed by the data collected from students' reflective essays. Interview questions asked participants to provide their overall reactions to the course, in order to gain insight into how the course affected them cognitively, affectively and behaviorally. To do this, I asked them to share their ideas about what was most engaging, influential and valuable from the course. I also asked them to share any new knowledge or application of skills acquired from their participation. Then, I directly probed their reactions to course design elements, including: 1) pre-departure and re-entry, 2) experiential learning, 3) agroecology concepts, 4) reflective practice, and 5) assignments. I further asked them to describe what they had hoped to gain by entering the course and to describe how they had situated the course within their overall academic program of study. I concluded each interview with an open-ended request for suggestions or modifications for improving the course. In addition to interviews, closing sessions that took place at the end of the

immersion portion of this course addressed key course concepts and pedagogies. These discussions were designed to review students' conceptual understanding of the commodity chain studied and to elicit feedback that would inform the design of future course iterations.

Audiotapes and transcriptions from individual and group interviews, as well as analyses of student work associated with these course iterations, were triangulated with participant observation notes and course archives for an inductive analysis that aimed to analyze relationships between course concepts and learning objectives, and analyze pedagogical relationships between this course and high-impact practices. Data were compiled and organized using selective coding strategies into major themes, through a grounded theory approach to content analysis. To begin this process, interviews, field notes, and reflective essays were openly coded through digital highlighting to determine a range of concepts that were grouped into conceptual networks that determined key coding categories. From these categories of similar concepts, I developed research theory. I was able to share this theory with the lead course instructor of agroecology and with student participants through the 2011 reflection seminar course to verify the validity of my findings and to obtain further feedback regarding the integration of four high impact educational practices with immersion-based agroecology education.

Limitations to this study include its small-scale nature, consisting of one immersion course in one mid-size Land Grant University of Agriculture. Conclusions from this research may not be directly transferable to other international agroecology courses at other universities, and thus this research does not comprise directives for others designing agroecology immersion courses. However, based on the in-depth nature

of the study and its rich, thick description, findings illustrate pedagogical concepts that could benefit the design and development of similar courses and programs focusing on agroecology and livelihoods at other universities. An additional limitation to this study includes the potential for bias that exists based on my combined role as both course co-instructor and researcher. I have attempted to reduce bias through use of applied social research methods that reduce validity threats associated with my dual roles.

3.4 RESULTS

3.4.1. Agroecology Education

Agroecology education was founded on student engagement in interdisciplinary learning that integrates them into the natural and social sciences in a way that recognizes human influence on agroecosystems. Design for this course mirrored this principle by organizing the learning experience around the development of interdisciplinary skills in these hard and soft sciences that would build conceptual knowledge about coffee production in an applied way. The second major principle of agroecology education expressed through this course is comprised of learner-centered and reflection praxes that bind instructors, students, and clients together in critical discourse that considers roles, norms, and worldviews in relation to agricultural development, with specific emphasis on the role of power in relation to social change and sustainable development. The intent of this principle is to build capacities that lead to responsible action in relation to the transformation of integrated agricultural and human systems. This course demonstrated two ways in which it was innovative and distinct, aligning with both of these core

principles of agroecology education. First, students learned to collect and integrate natural and social science research data through their immersion experience. The vehicle for this interdisciplinary learning was an assignment that required the students to collect and analyze both types of data and share their findings through a field report. This assignment mirrored the type of research data collected by the primary course instructor through his longstanding participatory action research processes with these communities. Second, they were immersed in learner-centered inquiry and reflective practice that took place through discourse in order to learn about agroecological and livelihoods practices of the small-scale coffee farmers of Western El Salvador.

The natural science concepts and methods for this agroecology course consisted of gathering data from farm plots to measure tree biodiversity within farmers' fields. From this data, they gleaned information regarding farm management practices for coffee production. Through focus group discussion, a student described how observation and plotting areas for tree inventories resulted in firsthand experience with how research is done. Students found this activity useful for realizing that research does not always take the form of structured, scientific experiments. With regard to the tree inventory transects, the majority of the students who enrolled in the course were social science majors who had taken few lab classes. They hadn't had experience with this type of data collection prior to immersion, nor did they have a high level of comfort with the natural sciences in comparison to the social sciences. These students were keenly aware of the few natural science majors participating in the course. Although the lead course instructor prompted students with questions that addressed the ecological side of coffee production, they found that only the students enrolled in natural science majors, that included ecological

agriculture and forestry, highly engaged with these questions. While students didn't feel that they had the skills needed to effectively conduct this research on their own, they agreed that these experiences helped them understand how researchers undertake answering agroecological questions.

The social science component of the course's interdisciplinary design occurred through interviews with farmers. To prepare for these "livelihoods interviews," students engaged in inquiry-based discussion to determine themes from which they would develop their questions for the farmers. Themes for data collection included: 1) cooperative farming structure and coffee production practices, 2) economics of coffee production, 3) health care and education, 4) gender and youth roles, and 5) entrepreneurship. They then conducted interviews with farmers and analyzed the data gathered for synthesis into their field reports. This activity was modeled after the research undertaken by Dr. Mendez and his research group so that students could experience real-world social science data collection and analysis methods firsthand. These interviews contributed to student understanding about the agroecological choices made by the farmers. They also connected well with group reflection sessions, as they focused on specific and integrated topics of interest, such as the economics of the coffee value chain and ecosystems services. Connections were further made between these interviews, group reflection, and individual topics of interest that arose during the required fall coffee course. Overall, students indicated that the interviews gave insight into: a) how Americans were perceived in El Salvador, particularly with regard to American consumption patterns, and b) the struggles that cooperative farmers were facing in their transition to organic coffee production. Further, they indicated that overlap between data collected from the social

science interviews and the natural science transects provided them with enhanced agroecological understanding of organic coffee production practices, both from production and economic standpoints.

Students overwhelmingly agreed through reflective discussion, focus groups, and individual interviews that this course effectively integrated the natural and social science disciplines. Students felt that it was crucial to have the combination of the livelihoods interviews in conjunction with the tree biodiversity field data because the interviews allowed them to learn directly from the farmers. In addition, students referred to the interdisciplinary exchange that occurred from having students from a variety of majors engaged in the course as an effective means for learning. They indicated that the course provided them with a broad spectrum of historical, cultural, and coffee production information as a result of the blend of social and natural sciences. Focus groups engaged students in discussion about the value of this interdisciplinary learning. A student stated that natural and social science theory and practice are too separate, as are the ecological and social aspects of coffee agroecology and livelihoods. Interdisciplinary learning was thus identified as necessary for deep and systemic understanding of the coffee value chain. A second student summed up her learning from the interdisciplinary approach by stating that the coffee value chain components are all very integrated and connected, so that working in this setting would require more than one specific set of knowledge from a singular discipline.

Students in these two course iterations described through focus groups how they learned about agroecology and livelihoods through critical reflection, which involved them in collaborative thinking, comparing perspectives on common experiences, and

comparing classroom and field experiences. Reflection was described by students as a way to: a) enhance learning by allowing them to go deeper into making meaning with others than they could through initial reactions to their experiences; b) build continuity through the integration of experiences over the timeframe of the course; c) form relationships with their peers and instructors throughout the learning process; and d) attain a deeper synthesis of information. In addition to being able to reflect on their prior activities, reflection provided a space to talk about the following day's itinerary and to ask questions in preparation for them. As a result of engaging in intentional reflective practice, students indicated that they were better able to understand course themes, retain more information, and were able to hear the differing perspectives of group members. According to one student's reflection, they deconstructed their understanding of the world based on experiences and reflected upon these understandings. This was done through both reflective practice and through conversations with farmers, and was identified as the most powerful piece of experiential learning within this course context.

Evening reflection sessions offered the opportunity to delve into agroecology and rural livelihoods content. These sessions involved a combination of reflection on course experiences as well as inquiry into topics of student interest that emerged both prior to, and during, early immersion activities. Themes emerged based on guided instructor facilitation that focused on connections between these student interests in combination with themes deemed important by course instructors. For instance, students addressed livelihoods topics that included: a) the socioeconomics of coffee production and the impact of low education levels, b) health care and food security issues prevalent within these communities, and c) the benefits and challenges associated with farming

cooperatively, from the provision of jobs and opportunities to build community relationships and shared leadership to the conflicts that result from this structure. These inquiry-based themes were developed into questions for livelihoods interviews and became areas to explore through all high-impact aspects of the course immersion. In addition, reflection offered students opportunities to compare experiences associated with visiting two different types of coffee farms and the natural forest that buffered the coffee region under study. They did this by dividing into two groups to conduct livelihoods interviews and collect tree biodiversity data. Each group brought their data collected within one community to evening reflection to be shared with the whole group. From these discussions, students indicated that they were better prepared to work in small groups to complete their field report assignments. Evening reflections further allowed students to utilize the compare/contrast genre to make meaning from their course experiences. They compared their observations of the farming landscape to that of the preserved area that buffered these farming communities. They discussed observed contrasts based on the private coffee plantations visited when compared with the cooperatively managed shade coffee. Their observations were both ecological and social, with references made to plants, insects, temperature, and structural facets of the forest canopy. Through this reflection, they noted differences in the business models employed by the two types of coffee production sites visited, and they alluded to power and privilege evident in the large-scale production model.

3.4.2. High Impact Educational Practices

Individually, three of the four HIEP mentioned in the data demonstrate results that

corroborate closely with the literature. These include study abroad (SA), learning communities (LC) and service-learning (SL). The first two (SA and LC) discussed here happen naturally in immersion-based learning formats, whereas SL and undergraduate research (UR) benefit from an interdisciplinary educational focus. Findings associated with UR demonstrated innovative and profound impacts as students engaged alongside faculty and community partners in participatory action research (PAR). Findings associated with the integration of these multiple HIEP offer insight into achieving deep learning and student development impacts through short-term, international immersion learning in agroecology.

3.4.2.1. Study Abroad

Findings from this study concur with previous studies on study abroad (SA) in several ways. First, students pointed to the high level of impact that resulted from psychosocial learning and development, which led to deeper conceptual and personal learning and development. In addition, facilitated reflection supported these gains, particularly with regard to the development of communication skills and cross-cultural competencies. It was the international immersion aspect of this course that laid the groundwork for three additional HIEP to deepen student learning and development.

In line with the research on SA, what impacted students most about the immersion was the psychosocial learning and development that occurred as a result of its short-term format. Students were impacted by stimuli within the small-scale coffee farming communities of Western El Salvador that challenged them psychologically, and led to new understandings about Salvadoran coffee farming culture and enhanced

understandings about themselves. They were faced with the need to develop communication skills in order to work alongside and learn from their farming partners. Although they faced a severe language barrier as most students were not fluent in Spanish, they considered non-verbal communication and translation support from peers and instructors to positively influence their experiences. Facilitated reflective discourse served as the primary means for addressing such obstacles and furthering their development. Based on these reflections, students explored the coffee communities in-depth, connecting with their classmates around meaningful service. For a few students, they further reflected on the influence of this course on their programs of study at UVM.

Students found the immersion format for learning stimulating and engaging. They compared this experience to their on-campus, lecture-based classes, stating that those classes lacked active application and were constantly interrupted by other aspects of the undergraduate student experience. In addition, the students were drawn to the sensory stimulation associated with the immersion, including stimuli from course activities such as zip-lining, coffee harvesting and hiking through the coffee landscapes. One student described how this experiential nature caused him to want to learn more about the topic. A second student agreed and commented that it opened her eyes to ecology, which was not part of her prior background or interests. Through focus group discussion, students commented on the powerful learning that occurred from the social connections and interactions with the people that they were learning from, both through verbal and non-verbal interactions. Numerous students referred to the “shadow a farmer” exercise as an effective way to build relationships with the farmers. They felt that these interactions and relationships created the space for deeper inquiry into subject matter.

Based on what was shared through focus groups and individual written reflection, poverty was a common element that affected students psychosocially throughout the immersion. Students were most affected by the contrast in material wealth when considering American lifestyles and consumer expectations in comparison to those of these small-scale farmers. For instance, they recognized that there was much less cultural value placed on leisure in these communities when compared to their own experiences in the U.S. Experiences with poverty brushed up against concepts of inequality that emerged during reflective practice, when feelings such as anger, pity, frustration and sadness emerged based on their interactions with the farmers. Students were affected by the amount and type of work undertaken by these farmers in order to produce coffee and feed their families, with further reflection on the high level of resilience required to do this type of work. As a result of this experience with poverty, three students described enhanced levels of personal reflection around their own ideas, feelings and choices made back home. One student described how discussions of poverty and high-intensity labor were discussed in the fall coffee course but had no emotional impact on him. A second student stated that this experience with poverty made him “more intrigued and reflective about what I feel and how I understand.” The third student shared how she felt that the course reinforced some of her reasons for being a community development major. Students indicated that the combination of “humbling” and “inspiring” experiences that took place within the homes of the farmers motivated them to share their course experiences with others back home. For instance, two students described how they became interested in doing something positive for these communities and within their home communities as a result of these experiences. When discussing their return to the

US, students described how: 1) they would need time to process their intense reactions to their SA experiences, 2) they would struggle when talking with peers with different viewpoints about coffee consumption, and 3) they would find complex issues challenging to relate to the people back home. To conclude the discussion, students described how home visits with the farmers would influence their own consumer behaviors, such as looking into the origins of food products and other goods.

3.4.2.2. Learning Community (LC)

The purpose of a learning community (LC) is to create more profound and personally relevant learning. Key to developing this LC was the intentional linking of three courses. The Café en Tacuba learning community was formed by connecting students enrolled in a classroom-based, semester-long, three-credit course (PSS21: Coffee Agroecologies & Livelihoods) offered during the fall semester to this three-credit immersion course (ENVS 295: Coffee Agroecology & Livelihoods in a Shade Coffee Landscape of El Salvador) offered over the winter session. Links between the content delivered to them in the fall became the focus of their applied learning in El Salvador. PSS21 was required as a prerequisite course so that students would have a foundational and shared interdisciplinary framework upon which to construct knowledge. Pre-departure provided them with a shared foundation that resulted in better conversations with one another based on shared trust. Descriptions of ongoing relationships with community partners were clearly outlined for students prior to leaving the U.S., which further reinforced their own relationships alongside community partners once abroad. As a result of this LC organization that involved fall content and pre-departure activities, a

greater level of reciprocal learning was achieved. In addition to the intentional linking of the fall and winter courses, a third course was added to this sequence in the spring of 2011. Instructors realized that students would benefit from this additional one-credit reflection seminar, as it was designed to help them complete assignments, reflect more deeply on course experiences, and it provided opportunities for them to go deeper into course content.

Students from the 2011 course discussed the intentional linking of these three courses through reflective discussion and a group interview. Through these discussions, they indicated how this linked structure supported their LC focus on the coffee value chain. They discussed how the fall coffee ecologies and livelihoods class provided an interdisciplinary framework for the immersion course. It provided them with foundational concepts that gave them a baseline of common knowledge so that they would not have to be introduced to new concepts during the immersion portion of the course. Further, the real-world context of this course surrounded the students with what they had been learning about in the fall. According to these students, it would be hard to imagine taking the immersion without the prerequisite course because it offered a wealth of background information useful to making meaning from immersion experiences. Specifically, they identified the following benefits to have resulted from their participation in the prerequisite coffee course: a) They realized that they wanted to engage in in-depth inquiry with the farmers around their livelihoods; b) They indicated that they were better able to connect intellectually and emotionally with what was observed in El Salvador based on what was learned through the fall course; c) They agreed that they would have been overwhelmed by information had they not been

provided with foundational concepts prior to the immersion; and d) They discovered that real-world observations enhanced learning when compared to classroom-based observations. For instance, one student described, and others concurred, that observing coffee plantations and their canopies was a more effective way to make sense of the differing types of shade cover when compared to viewing shade diagrams on paper through their classroom-based prerequisite experience.

Part of study abroad is living in close proximity with professors, and living with other students in shared lodging. The shared living situation was very conducive for LC development, as the students stayed in groups of three in cabins and shared meals with one another and with course instructors. They were the only group staying at the lodging site, which also provided a meeting space for shared reflective dialogue. This situation was one of the most supportive aspects of LC development. In addition to a tightknit living situation, there were other contributing factors to the development of a strong LC. These factors included periods of time focused on: a) moments when students and instructors supported one another through periods of sickness and wellness; b) students working together in small groups to complete projects and write team reports; and c) critical dialogue and reflection about immersion experiences. Based on reflective discussion, interviews, and focus groups, it was clear that relationships that developed between students, between students and instructors, and between students and farmers during the immersion were important for LC development. Students commented on the positive dynamics created between students and instructors that were based on respect and engaged learning. Students felt that course instructors helped them understand the complexity of the coffee value chain, and they appreciated reflective discussion

facilitated by the instructors. They indicated that this discussion enhanced their learning by tying comments together with broad conceptual themes, and by showing them varying perspectives on coffee agroecology issues. In addition, students found it beneficial to hear other people's insights in relation to their own, and they found this sort of reflection to be unique in comparison to other classes. For some students, the informal discussion and interactions with instructors and farmers were just as important as the facilitated reflection, indicating that these too were powerful learning experiences that enriched their LC.

3.4.2.3. Service-Learning

Service-Learning (SL) is founded on integrative learning that involves students alongside instructors and community partners to collectively address community needs associated with real-world issues. The intent of this pedagogy is to engage students in deep levels of student learning and development, with emphasis on the realms of interdisciplinary problem-solving and civic participation. For most students who participated in Café en Tacuba, the service-learning component was the real motivation for going to El Salvador, and for many of them, it was the most engaging aspect of the course. Typically, semester-long SL projects build relationships with a client over time. Given the short timeframe for this immersion, this was not going to be a possible outcome. Although the level of service was very modest, the learning was still tremendous, and the farmers were very appreciative of the students' service. In addition, SL in this course was important because it strengthened the LC through deeper relationships among all course participants, regardless of their role.

The SL model employed through this course consisted of a pre-departure and/or a re-entry service component that bookended a coffee harvest experience, the central SL experience for the immersion portion of this course. For the 2009 student group, their involvement in a pre-immersion benefit dinner designed to raise money for the cooperative association provided exposure to foundational course concepts that aided their understanding of immersion course experiences. Through this activity they learned about the participatory action research (PAR) processes that were being employed with farmers in these communities. One student described this service activity as an introduction to the external forces affecting change in coffee growing communities, providing economic benefit for the farmers. During course immersion, both groups engaged in a half-day of coffee harvest, which was equivalent to just five percent of the ten-day immersion experience. Although this experience comprised a very small portion of their course, student interviews, reflective writing, and discussion indicated that it offered profound educational impacts. Through the harvest, they engaged in sensory experiences to learn about coffee production, from landscape attributes and shade structure concepts to the qualities of the labor associated with this farm work. Through reflective discussion, they described their experiences on the steep mountains where the coffee is harvested, noting the challenge of the manual labor associated with coffee collection. One student stated that this experience made the injustices of the coffee chain more real to him. Similarly, a second student described his observations of the coffee bushes and compared how rapidly the farmers worked in relation to the students. This “shadow a farmer” activity gave them insight into what it would be like to harvest coffee on steep slopes. It further exposed them to the high level of skill needed to effectively

and efficiently harvest coffee. To build on the coffee harvest, students suggested through focus groups and reflective discussion that they would take initiative to engage in greater levels of post-immersion service to “do more” to help these communities. The second cohort engaged in a one-credit, semester-long, re-entry course following the immersion course through which they developed a second fundraising event. They worked with a research assistant at UVM and a local yoga instructor to organize a yoga benefit and coffee cupping experience to raise money for the youth scholarship fund. They engaged participants in focusing on the change agent aspect of getting involved with supporting these communities, and they felt that they had contributed to positive impact on youth education.

3.4.2.4. Undergraduate Research

Undergraduate Research (UR) has two major purposes that include: a) making research available to undergraduate students in all disciplines, and b) building their enthusiasm to work in science-related fields to answer important questions. The means for engaging students in UR is often through individual projects in collaboration or supervised by a faculty mentor. Ideally, the projects are applied so that students build skills for graduate school. Rather than individual projects, the students in this course engaged in a collective project alongside their faculty instructor, and the skills targeted were the interdisciplinary integration of natural and social science research methods in agroecology. In addition, UR within the context of this course integrated students into the long-standing participatory action research (PAR) processes that existed between these coffee communities and the key faculty instructor of agroecology who led this

course. Students indicated through focus groups that their course experiences with PAR enabled them to sample interdisciplinary science research skills, giving them insight into applied natural and social research, and provided them with a glimpse into the competencies needed for developing and managing agroecosystems.

According to students, the lead course instructor clearly explained PAR processes and the relationships that had developed between these coffee communities and his research group at UVM—beginning with pre-departure readings and information-sharing about his research, and then through pre-departure service with cohort one, when students participated in the coffee communities benefit dinner where these research processes were highlighted. In addition to learning about PAR in broader terms and through the lens of their professor, the students learned about it directly from the farmers themselves. The students heard the farmers describe their appreciation for the long-term PAR processes that supported their conversion to organic production methods. They further learned about the value of sustained relationships as they observed the networks that developed through PAR that offered them better prices for their organic coffee, and they became aware of the health benefits associated with organic production. Students found it interesting and telling that the farmers indicated these benefits of engaging in PAR through their cooperative, yet they knew little about the coffee value chain and where the coffee went beyond their farms. Through these experiences, students were able to reflect on real-world agricultural research and development, and how it is conducted. They found PAR to be a useful tool and model for conducting research, especially the linkages between PAR and sustainable development.

Students were very curious about the role of outside actors in supporting coffee

growing communities, a theme that emerged through course discussion. As a result, topics such as power were discussed in relation to PAR concepts. This discussion highlighted the participatory nature and goal of equitable gain that underlies PAR processes. Students learned that farmers gained knowledge and skills through PAR processes, while the research group affiliated with the lead course instructor gained access to agroecological and livelihoods data of interest to them. They further discovered difficulties associated with conducting research in this way due to in-depth time and effort commitments. The students agreed that there is a delicate balance to be achieved between research needs and community needs when conducting research in this way. As a result of this discourse, students applied what they were learning about PAR and international community development to their immersion experiences with the cooperative members and discussed their ideas regarding best approaches to community development. This learning resulted from their engagement alongside a faculty mentor and a farming cooperative with a history of commitment to engaging in PAR.

3.5 DISCUSSION

3.5.1. Agroecology Education

The most recent innovations in the field of agroecology make it an ideal fit for engaging students in learning exercises that build problem-solving capacities and responsible action skills for meeting complex community needs associated with a globalized and industrialized food system. There have been a few recent innovations in agroecology education that target specific pedagogies for building such skills. These

include values-based education described by Galt, Clark, et al. (2012) that pays explicit attention to the values that: a) underpin agriculture and food systems; b) inform and shape educational strategies and experiences; and c) are held by individuals in a learning environment. A second example is the open-ended case study approach defined by Francis, Jordan et al. (2011) that engage students, faculty, and community partners in shared exploration of complex real-world situations “where often neither the relevant questions nor the answers have yet been identified” (p. 230). The Café en Tacuba course is another innovation comprised by high impact learning through student engagement in community-based service learning and participatory action research. This educational format builds upon several decades of educational design in agriculture, as described by Francis, Jordan et al. (2011), wherein professors develop courses in developing countries where they have previously engaged in sustainable agricultural development. Because this interdisciplinary course involved students from a range of majors, SL encouraged them to think in ways described by Reynolds, Brondizio, et al. (2010) —“more critically and deeply within their disciplines,” in ways that “foster understanding of the connections between disciplines that can then facilitate the application of knowledge to solve real world problems” (p. 187). Further, this research aligns with the ideas of Lieblein, Francis, and King (2000), who stated that action-oriented research and education coupled with reflective practice hold potential to revive educational environments. This immersion format set a new standard for student learning alongside community research partners by directly connecting both parties to applied, interdisciplinary social research and education.

Core to agroecology education and contributory to this course’s influence on

student learning and development was its focus on interdisciplinary agroecological research that highlighted both the natural and the social sciences. These ideas align with those of Francis, Jordan, et al. (2011) who point to a systems approach for studying agroecology across disciplines in order to support the development of key competencies for dealing with agroecosystem change. This innovation brought these integrated sciences to students in a hands-on way that allowed them to reflect upon the role of agroecological research and consider its application to real-world sustainable development in agriculture and food systems. It further offered great opportunities for building interdisciplinary research skills for students from multiple majors, thus bridging awareness across epistemologies embedded within varied disciplines, offering the potential to better prepare them for addressing relevant issues through their work beyond college. In line with the ideas of Jordan, Andow, et al. (2005), this sort of systems thinking for social analyses better trains scientists to address challenging and contentious problems, while service learning enhances the civic aspects of their professional selves.

Important to this interdisciplinary research methods approach to teaching in agroecology was structured student involvement in reflective praxis that enhanced their conceptual understandings of agroecology and rural livelihoods, and wove the two course themes together for increased understanding of the coffee commodity chain. It was this deliberate linking of reflection through the lens of agroecology to interdisciplinary course experiences that created space for critical discourse. This discourse involved them in worldview exploration by studying the roles, norms and values of the various actors within the system. Systematically, facilitated reflection served as a way to engage them in addressing the role of power within the system to better understand how differing

worldviews relate to land management practices and to sustainable agricultural development. These findings are supported by those of Jacoby & Associates (1996) who stated that reflection on experiences “can be shaped to increase students’ knowledge of course content while encouraging them to think in a more critical and complex manner” (p. 53). These authors further stated that reflection on experiences enhances students’ understanding of social problems while they explore their own identities. In a similar way, student reflection within the context of this immersion course is suited to support linkages between community partners’ and students’ worldviews so that students consider civic dimensions of life and work beyond the confines of this course. In line with the ideas of Jordan, Andow, et al. (2005) and Jordan, Bawden, et al. (2008), these explorations offer opportunities to gain greater insight into systems complexity and engagement with topics pertaining to worldview transformation and social change relevant to sustainable development.

3.5.2. High Impact Educational Practices

Facilitated learning experiences designed with attention to HIEP are effective for meeting educational outcomes associated with student learning and development. In this section, I discuss study abroad (SA) and learning community (LC) as *passive aspects* of immersion course design before addressing the *active aspects* of service-learning (SL) and undergraduate research (UR) that have a more powerful influence on learning and development within immersion agroecology settings. SA and LC were typical to other international immersion designs that tend to engage students as tourists studying a particular topic in a foreign place. The same holds true for LC, although I do discuss the

unique sequencing of three course types to create an enriched learning environment, as well as the necessity of faculty committed to undertake the work of developing a LC. I discuss SL and UR in greater detail, sharing novel contributions to immersion course design in higher education. I discuss modifications to the traditional semester-long SL approaches, including how to deal with the severe time barrier for achieving long-term impacts for partner communities. I further highlight the educational and civic-related gains from immersion-based SL. Of the four HIEPs that were relevant to my study, UR seemed to indicate the strongest impacts as students were immersed in both interdisciplinary and PAR processes as a way to view the possibilities for making a real lasting impact in the world through applied research. To further this impact, I suggest an extended research period that would incorporate student data into faculty research in a way that would enhance benefits for all stakeholders. The combination of all four HIEP within our course context compounded and supported one another for enhanced student learning and development.

3.5.2.1. Passive Aspects of Immersion Course Design

The outcomes of this immersion course were in line with what has previously been found about short-term study abroad courses, including the acquisition of new understandings about the self and immersion environments based on psychological stimulation (Gmelch, 1997). With regard to the short-term nature of this immersion format, findings are in line with those of Jacoby & Associates (1996) who state that these formats can be foundational for: a) community explorations, b) connecting with peers around meaningful activity, c) learning about the self through reflective practice, d)

identifying service possibilities alongside community partners, and e) urging students to further focus their programs of study. In addition, this international immersion format promotes interdisciplinary conceptual learning as a result of access to practical and uninterrupted learning, when compared to classroom-based university courses. These courses connect personal meaning to experience, which aligns well with students' educational values. Facilitated reflection is the key factor for construing new knowledge, attitudes, skills and behaviors associated with these connections. As a result of this format, students find themselves reaching deeper to discover new insights about themselves and to discover heightened interests in their own personal learning and development.

Similar to the ideas of Jacoby & Associates (1996) who describe enhanced personal development resulting from students coping with change and solving problems, higher levels of personal reflection result from brushing up against psychologically challenging stimuli. Specifically, immersion study abroad in impoverished agricultural regions of Central America (C.A.) offers opportunities to deeply touch the affective realm of the students' experience. Shephard (2006) discusses the advantages of achieving affective outcomes in courses focused on sustainability. He states that such outcomes tend to be more complex than those found in many areas of study, with pedagogies for achieving them taking the format of group processes that are contextualized in science and society. Competencies associated with achieving outcomes in this affective domain include those that "involve judgment that integrates conflicting experiences and incomplete information sets" (p. 93). Through struggles to make sense of the great contrast in material wealth between C.A. and their lives in the U.S., increased

opportunities for Café en Tacuba course discussions around power and privilege, equity and access, and the systemic structures foundational to these social issues arose. The sheer benefit that may be had from such experiences is the greatly enhanced level of personal reflection in each of the cognitive, affective and behavioral realms of personal learning and development. Student reflection conjures more interest in changing or modifying personal attitudes and behaviors to better match increased awareness and understanding of broad world issues. For this reason, it is essential to engage the students in facilitated reflection that balances their challenges with a sense of stability and care from course instructors. This effort has potential to result in what Gmelch (1997) describes as new understandings about culture and themselves. In addition, it is common for concrete reflection to have an impact for some students as they reflect on their academic program of study. Some find greater appreciation for their academic majors and coursework, whereas others find it necessary to make changes thereof. Regularly, these experiences can be the impetus for greater levels of post-course activism, as students become inspired to be the world's change-makers. They recognize early on that they will have to navigate their way through probable misunderstandings and social barriers that could limit the success of their follow-through with new ideas. For this reason, a re-entry, or reflection component of the course under the guidance of course instructors is key to maintaining student action beyond the scope of the immersion study abroad.

Instrumental to the development of an immersion learning community is the intentional linking of two or more courses for integrative learning around a predominant theme that involves high levels of interaction between students and instructors

(Gabelnick, MacGregor et al., 1990; Brownell and Swaner, 2009). It is this structuring of complementary courses that provides foundational concepts for framing dialogue and reflective discussion that connects course content with course experiences. A unique sequencing of lecture-based, immersion, and seminar course formats can be extremely effective for integrative learning, and works well alongside integrative and interdisciplinary fields. Pre-departure meetings are crucial for reviewing core concepts and logistics and for sharing information about community partners prior to going abroad. In our case, PAR was an important topic to discuss during pre-departure, both conceptually and through telling the history of PAR within the community of study, so that students could move quickly into undergraduate research alongside faculty once abroad. In addition, a lecture-based course provides not only conceptual frameworks for immersion, but offers students an opportunity to develop a heightened interest in core concepts and as they move toward their applied immersion. These two factors lay a foundation that enables students to deeply connect psychosocially with the content and with one another during the immersion. In addition to the intentional linking of courses, the intentional linking of pre-departure, immersion, and re-entry portions of such a course enhances interactions between peers as well as between peers and instructors. This opportunity to build trusting relationships is essential for critical dialogue and reflection, wherein students can develop listening and speaking skills through open dialogue around differing worldviews. Because the group size is small, members have greater opportunities to engage in such dialogue and reflection that is personally relevant and meaningful.

Necessary to immersion course development is access to experts in the field(s) of

study. Preferably, as in our case, the lead course instructor is a faculty member with a firm grasp on the conceptual knowledge to be conveyed through the course. Further, the faculty expert must be willing and able to guide students through the shared reflection that occurs in a close-knit living/learning situation with few periods of rest. For these two reasons, I agree on two levels with Gabelnick, MacGregor, et al. (1990) who: 1) recommend team teaching that involves interdisciplinary scholar-practitioners that can expose students to varied perspectives, and 2) describe the necessary and close proximity between instructors and students and among the peer group that is conducive to build a thriving and reciprocal learning community. Ultimately, these factors require a commitment from educators to engage in both the conceptual and the reflective aspects of experiential study abroad in order to develop a rich learning experience for their student group. This engages all parties in a powerful learning environment that is horizontal in nature, building upon the capacities of all participants to contribute to socially-constructed learning processes. Zhao and Kuh (2004) describe how such processes result in profound and personally relevant learning that offers exposure to differing worldviews.

3.5.2.2. Active aspects of Immersion Course Design

According to Jacoby and Associates (1996), SL is “a philosophy of reciprocity, which implies a concerted effort to move from charity to justice, from service to the elimination of need” (p.9). Crucial to effective SL within immersion contexts is the focus on meaningful structured service activities that address real-world social needs while simultaneously promoting student learning and development (Jacoby and Associates, 1996; Brownell and Swayner, 2009). SL can be the primary motivation for students to

participate in immersion study abroad as well as the most engaging aspect of these courses. According to Reynolds, Brondizio, et al. (2010), when this learning format is joined with reflection, it allows students to “develop higher-order thinking and empowers them with a sense of identity, place, and connectedness in the world” (p. 187). This allows SL to encourage learning about complex, broad social issues (Jacoby and Associates, 1996).

Through SL, students benefit most from what was described by Kuh (2008) and Brownell and Swayner (2009a) as educational and civic-related gains. These include developing an orientation toward social justice and a service-orientation toward future work. Although the impact may be small for their community partners, there are cross-cultural gains to be had on both sides of the service commitment. For instance, our harvest experience was primarily directed toward connecting students relationally with coffee farmers, which created beneficial cross-cultural outcomes for both parties. It also provided a modest labor benefit to the rural community under study and connected students directly to interdisciplinary course themes. Other agroecology courses could target similar outcomes oriented toward social justice and cross-cultural connections that offer opportunities for exploring differing worldviews and social issues. Once students become inspired through their immersion experiences to make a difference in the world, SL can spur their interest in extending service activities into the re-entry component of their course. Thus, there are great opportunities to “bring back home” what was learned abroad through service on campus and/or in students’ local communities. Creation of campus-based events that spread knowledge on topics related to important social issues in developing countries are often well-received by student audiences. For many students,

such SL experiences become introductory experiences in the realm of community activism. As stated by Kuh (2008), gains from such experiences include concern for real-world problems and considerations around their roles in these issues beyond their scope of college.

The traditional format for UR, as described by Brownell and Swayner (2009), involves students in individual projects mentored by a faculty member. The Café en Tacuba immersion format engaged students in a collective research project alongside their faculty instructor. We began this process through use of pre-departure time with students intended to prepare them for UR during their SA. We wanted them to learn as much as possible about the community of study prior to immersion so that their movement into the immersion would be as cognitively and affectively fluid as possible. We also intended to be clear about the goal of mutual benefit for both the researchers and the community members involved in these processes.

AAC&U (2008) describes how student exposure to science serves as a means to answer key questions to relevant problems. Café en Tacuba immersion students gained such insight by mixing their own disciplinary backgrounds and personal perspectives with others in the group. The conversations that ensued revolved around community needs and world issues, and were framed by their multiple perspectives. They heard from the faculty instructor about his experiences with interdisciplinary research that incorporates multiple disciplinary languages and methods for addressing such complexity. This mixing of students from numerous majors and disciplines was one success of our program and comprised an approach encouraged by AAC&U (2008) for enriching the UR experience. In reality, these students' reflection on real-world research

and development was just a sample. They viewed how development practitioners make management decisions in order to effect real world and lasting systems change. Although just a taste, students' experiences with PAR actively engaged them in real-world change processes and gave them insight into the role of PAR in international community development. They were also exposed to the challenges associated with conducting PAR over the long-term. Students were exposed to issues of power within community development networks. Tying the benefits and challenges of this UR approach to profound student learning and development, these concrete eye-opening experiences were discussed through facilitated reflection led by faculty experts, which allowed them to socially construct meaning from these research experiences.

3.5.3. Study Limitations and Recommendations

Due to the short-term nature of immersion courses, modifications to traditional semester-long SL have to take place. Based on my experience, I recommend the following six attributes of immersion course structure: 1) In agreement with Jacoby & Associates (1996), I found that it is imperative that immersion course instructors design a learning environment in which goals for both service and learning are of equal importance for all stakeholders contributing to a reciprocal learning experience. 2) It is critical that the lead course instructor determine community needs and SL activities in collaboration with community partners prior to student engagement. 3) Likewise, it is critical that students gain significant background community partner information prior to engaging in their SL activity. 4) I also suggest finding quick, one-time service activities that can provide incentive for students to engage with the interdisciplinary themes

targeted during their course. 5) In line with the ideas of Jacoby & Associates (1996) and Reynolds, Brondizio, et al. (2010), I suggest that activities address real-world complex problems so that students learn about broad social issues and the inequities that underlie them. 6) I concur with the research on SL that indicates the critical importance of faculty-led, facilitated analytical reflection to transform these experiences into learning and development (Kolb, 1984; Jacoby and Associates, 1996; Brownell and Swayner, 2009).

Instrumental to the success of this course was its format for *engaged learning* that links students to long-term participatory action research processes with coffee farmers in El Salvador. I found that student integration into PAR alongside their faculty mentor to be an ideal means for effectively integrating students into UR, and thus recommend the mixing of undergraduate students from multiple disciplines into UR through PAR for deep levels of learning. Given this important course element, faculty should only design and teach similar courses with prior establishment of similar research relationships within their communities of study. Given such research relationships, other agroecology courses should target similar outcomes oriented toward social justice and cross-cultural connections that offer opportunities for exploring differing worldviews and social issues. One way to approach such learning and development outcomes would be through awareness and outreach activities developed for a re-entry portion of a course timeline. In addition, similar courses should engage students in viewing their data contributions to these longer research processes. The way we attempted to begin this process was by exposing students to the history of the research process, including research presentations and publications, so that they could gain insight into how their data collection contributes

to higher learning in agroecology. A next step for this study should be to determine ways in which students can become involved in firsthand research contributions.

Given the benefits associated with HIEP in this immersion context, it is important to share its shortcomings. There may not be a perfect combination of HIEP that will meet learning and development outcomes completely within this course context. The data indicate that there are significant challenges associated with creating long-term impacts for both students and community partners. This series of courses comprises just one small piece of students' overall academic experiences, and there may be a false sense of relationship between students and partners, as their time together is incredibly brief. There is also a commonly expressed desire from American students who participate in SA in developing countries to help communities in need. This tendency reflects an element of privilege that may be unrecognized and is often left unpacked by students within immersion groups. Further, there is an accessibility issue, considering the costly financial investment required to participate in these courses. It is up to the course instructors to make efforts to "unpack the invisible backpack" of white privilege associated with these types of experiences (McIntosh, 1988). This can be addressed through cross-cultural activities during pre-departure, as well as through reflective discussion during and post-immersion.

An important area of student growth that could not be determined within this short timeframe was skills development associated with community-based problem solving processes. Given the short-term nature of the immersion format, pre-departure is critical for teaching students about community development processes. Although building true relationships with community partners is not possible given the short course

duration, this direct connection to long-term research via their course instructor creates dynamic, trusting relationships between community partners and students. In this context, short-term SL and PAR experiences build action-oriented interest in taking initiative well into the future. These courses do not inherently have the structure to support these outcomes, but they are contributory by nature. Given emphases on the importance of these *active aspects* of immersion course design for student learning and development within this course context, the field of agroecology education would benefit from learning to measure the extent to which students develop problem solving skills through immersion course formats. Despite these study limitations, the study does shed light on the role of HIEPs in international immersion-based learning in agroecology. It further generates more questions about these high impact practices than it answers. These questions could serve to launch further studies into the *active aspects* of HIEPs by others interested in developing courses or programs in agroecology and food systems.

3.6. CONCLUSIONS

The general objective for this research was to gain insight into the integration of agroecology education and high-impact educational practices (HIEP) through immersion course design in higher education. Specifically, this research was conducted to find out how four HIEP pedagogies (study abroad, learning community, service-learning, and undergraduate research) tied to an upper-division, undergraduate, and immersion agroecology course work together with agroecology education to influence student learning and development.

There are three core pedagogical praxis components associated with agroecology education and HIEP that were demonstrated by the Café en Tacuba immersion course to positively impact students' perceptions of their learning and development. These pedagogical praxis methods include: 1) an experiential learning typology considered desirable by students, 2) facilitated reflection that connects active learning and justice issues, and 3) a unique HIEP structure that joins the *active aspects* of immersion course design (service learning and undergraduate research) to the innovative and *passive aspects* of its design (study abroad and learning community). This was done so that the active aspects of its design intentionally connect to the longer timeframe and multiple educational formats offered through the learning community combination of: a) a prerequisite course, b) pre-departure sessions, c) immersion, and d) a re-entry seminar. Students seek these types of experiences that engage their senses, offer insightful learning about the self and others, and connect to issues of justice. These experiences are considered engaging because the learning is perceived to be tremendous by students, regardless of the modesty of their contribution to a partnering community.

This research points to the excellent fit that exists between agroecology education and HIEP. HIEP have proven lasting positive impacts on undergraduate students. They integrate well with one another through immersion contexts and merge well with agroecology education to create profound learning and development opportunities for students, as they become involved in engaged learning alongside community partners. Thus, the integration of agroecology education with HIEP offers opportunities to create effective and innovative models for such immersion learning in food systems. Study abroad serves as a building block for creating the learning environment through which

students can delve deeply into the other three HIEPs discussed in this paper. A cohesive learning community develops naturally from course sequencing, pre-departure, shared meals and lodging, and facilitated reflection. Mixing of undergraduate research and service learning within the learning community model has great potential for the operational design of international immersion courses in agroecology, particularly when undergraduate research focuses on participatory action research (PAR). This research addresses the unique integration of PAR with SL for enhanced educational outcomes. Links to longstanding PAR processes offer a core connection to engaged learning that results in positive perceptions of personal learning and development. Given the short-term nature of the immersion format, pre-departure is critical for teaching students about community development processes. Although building true relationships with community partners is not possible given the short course duration, this direct connection to long-term research via their course instructor creates dynamic, trusting relationships between community partners and students. SL and PAR experiences build action-oriented interest in taking initiative well into the future. These courses do not inherently have the structure to support these outcomes, but they are contributory by nature. Thus, agroecology education offers opportunities to develop a wide range of immersion courses that focus on an array of food systems topics, particularly when taught with attention to HIEP.

The field of agroecology education is ripe for teaching and learning in food systems. It offers expansive opportunities through immersion formats for farm-based education and case studies in sustainable agriculture and food systems. The study of regional agricultural farming systems helps students make meaning of diverse

worldviews. Power and complexity issues emerge as students gain greater understanding of agroecosystem management challenges in developing countries. Immersion courses that engage students from varying disciplinary backgrounds offer opportunities to integrate a greater diversity of perspectives and worldviews, resulting in enriched discourse. Immersion agroecology formats are ideal for the juxtaposition of students and community partners' worldviews to create dynamic learning environments, particularly when incorporated into reflective discourse facilitated by faculty. It is this reflective practice that binds meaning with experience and transforms experience into new knowledge. It serves as a tool to guide discourse processes that result in enhanced learning and development, as students build meaning from shared experiences that can be critically analyzed to better understand world food issues. Thus, reflective practice plays a crucial role in the transformation of students' worldviews as they engage in collaborative thinking and socially-constructed learning. This is a potent time for engaging students in discourse associated with sustainable development and food systems, and this study gives rich indication that agroecology education should be a starting point for designing comprehensive learning formats for food systems. Agroecology combines distinct learning in the interdisciplinary social and natural sciences, particularly when coupled with contextualized agroecological research. Students become better prepared to understand agroecosystem management practices from a variety of perspectives, and they benefit from hands-on, interdisciplinary experiences that build skills in the areas of problem solving, communication, and research. These are precisely the skills that are outlined in the literature as those that will be most needed for meeting our present day and future world challenges.

Agroecology education (AE) should serve as a primary vehicle in the Education for Sustainable Development (ESD) movement worldwide. AE formats align with ESD processes and learning that involve a shift in pedagogical approaches for addressing sustainable development, including those that involve students in processes of engaged learning and democratic citizenship participation. As contents associated with food production are relevant to the global population, and experiential education can meld into any place as it shares characteristics of more traditional tourism, experiential agroecology education creates an ideal learning environment for food-systems based immersion learning. This highly popular format harbors great potential for increased learning and development, which can take place both within and beyond the confines of higher education as students critically engage in innovative processes that involve collaboration, systems approaches to learning, and active participatory learning that involve students in values clarification for enhanced awareness of worldviews. These processes integrate easily into immersion agroecology contexts and allow the essential combination of critical dialogue and problem solving processes associated with ESD to occur. Through these processes, participatory engagement in social, economic, environmental, and educational change processes essential to sustainable development can take place. Additional educational contexts, such as international organizations focused on food issues, should undertake further innovations in ESD in agroecology. Meanwhile, it is encouraging to see institutions of higher learning addressing their commitments to advance sustainability, both locally and globally, by supporting the development of innovative food systems educational programs.

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CHAPTER FOUR

GREENHOUSE RESIDENTIAL LEARNING COMMUNITY

4.1. INTRODUCTION

This research completes an analysis of the relationship between Education for Sustainability (EfS) and program design and development within a residential learning context with a commitment to sustainability at a land grant university. It is based on a strong, current focus in higher education on interdisciplinary environmental education to address the “wicked problems” of our era, including those associated with climate change, air and water pollution, overpopulation, hunger and poverty, and biodiversity loss. According to Finger and Asun (2001), addressing these topics requires an educational response that prepares societies for addressing the challenges of sustainability. The EfS framework, utilized for this research analysis, is one response to these “grand challenges.” EfS is characterized by the following broad principles: 1) holism and systems thinking, 2) interdisciplinary understanding of ecological systems, 3) emphasis on active, experiential, and inquiry-based learning, and 4) contextualized problem-solving within communities (Cortese, 2003; Sterling, 2004; Garcia, Kevany et al., 2006). As identified by Sterling (2004) in his publication on the international development of sustainability education, holism and systems thinking serve as a way to shift educational policy and praxis toward an emphasis on the nature of the learning experience rather than on predetermined outcomes. He describes how facilitated experience nurtures personal or social transformation via a constructivist view of the

learner that places importance on the learning context and on the learner's prior experience, disposition and uniqueness. It also expedites capacity building in the form of critical, systemic and reflexive thinking that results in a systemic worldview shift. This transference directs societal concern and perception toward the integrated economic, social and environmental interdependence of issues—ultimately with the intention of creating new patterns of behavior toward the environment, from individuals to groups and to society as a whole (Sterling, 2004).

A parallel study of praxes for organizational learning and program development was targeted in order to discover tools that work and that may be transferable to other learning models. This study utilized action research (AR) and utilization-focused evaluation (UFE) to guide these praxes with program stakeholders. AR is an approach to generating knowledge within a study setting while addressing societal problems, as it links theories of change with useful action within communities (Stapp, Wals et al., 1996; Herr and Anderson, 2005). It is based on the notion that “the people most affected by a social situation ought to be the ones evaluating it as well as empowered to take action to change it” (Stapp & Wals, 1996, p. 29). AR results in growth and development outcomes. In this case, AR outcomes targeted organizational learning and program development. Complementary to AR, UFE served as a tool for reflection and action at these dual scales of program development and organizational learning, further supporting possibilities for transformation at both scales. Patton (1982) defined this ‘user-focused approach’ to program evaluation, which places emphasis on the interests of stakeholders, including information needs, such as information relevant to making decisions, judgments, comparisons, or the assessment of program goals (p. 35). Similar to AR, a

primary function of the evaluation was to support action within the organization.

Residential Learning Communities stemmed from liberal education initiatives of the late 1960's that attempted to tackle problems in higher education. For instance, the University of Vermont (UVM) introduced the Experimental Program in 1968 that addressed issues of knowledge fragmentation, lack of relevance, and a diminished sense of intellectual community. This residential program "blazed a trail, suggesting UVM students academic lives and residential lives didn't necessarily need to be separate lives" (Weaver, 2013, p. 17). Modern day residential learning communities target holistic engagement, intentionally encouraging student initiative as a portion of their educational experience. This type of engagement, or *engaged learning*, is an emergent trend in undergraduate education (Waters, 2006). It reflects the fact that "as much as half of the learning that goes on in college takes place outside of the classroom" (Weaver, 2013, p. 19). Engaged learning is characterized by "safe spaces" that encompass respect and openness for dialogue and inquiry about global issues and perspectives (Murphy, 2010, p. 40). Students engage "with the human condition" in order to learn "about humanity" (Bowen, 2005, p. 5). Another essential element of engaged learning is similar to active, experiential, multidisciplinary and service learning, where the focus is on the learner and the learning environment (Bowen, 2005). It involves service learning as an important pedagogy that "connects meaningful service to academic learning, personal growth and civic responsibility" (Murphy, 2010, p. 39). According to Murphy, these processes encourage "critical literacy and independent thinking necessary for successful engagement with present-day society" (p. 40).

This study reviews the engaged learning and EfS elements of the GreenHouse

Residential Learning Community at UVM that targets place-based ecological literacy and active citizenship outcomes with its undergraduate student members. An EfS framework was applied to program analysis to determine links between pedagogical praxes and educational outcomes for its student residents. The research occurred over the course of five years, from 2009-2013, and included data collected for the years 2007-2013 in order to both measure program effectiveness during the first two years of the program and to engage in a process-oriented participatory evaluation for the purpose of action-oriented learning at the organizational level.

4.2. LITERATURE REVIEW

Sustainability education focuses on the Triple Bottom Line of social, economic, and environmental interdependence for sustainability. This focus requires a transformative shift in pedagogical praxis that cultivates student learning via a holistic educational model rooted in interdisciplinary and inquiry-based learning that fosters solid analytical, communication, technology and leadership skills. The theoretical framework underlying Education for Sustainability (EfS) stems from environmental education philosophy, situated within a ‘postmodern ecological worldview’—an emerging worldview that has been explained as systemic, holistic, and participative, (Huckle and Sterling, 1996; Cortese, 2003; Barlett and Chase, 2004; Corcoran and Wals, 2004; Sterling, 2004; Garcia, Kevany et al., 2006) wherein “ideas shift from ‘things’ to relationships, and from a segregated and dualistic view of the world towards an integrative and participative perspective” (Sterling, 2004). This notion rejects the

deterministic position of education and moves it toward a focus on the holistic nature of the learning experience (Jickling, 2000; Sterling, 2004). Requirements that must be met at the higher education level that encompass holism and systems thinking include a fundamental, transformative shift in thinking, values, and action; interdisciplinary systems thinking in all majors and disciplines; an emphasis on active, experiential, and inquiry-based learning; and contextualized problem solving within communities (Cortese, 2003; Sterling, 2004; Garcia, Kevany et al., 2006; Steiner and Posch, 2006). Included in this discourse is a focus on the need to provide inter- and trans-disciplinary systems thinking opportunities within educational environments (Smith and Williams, 1999; Calder and Clugston, 2003; Cortese, 2003; Rebello, 2003; Cullingford, 2004; Garcia, Kevany et al., 2006; Rowe, 2007). According to Sterling (2004), this movement toward systems thinking surpasses the mechanism and reductionism of the modern paradigm allowing for a systemic worldview that enables educators to integrate the social, economic and political elements of current world issues into educational curriculum. The idea behind this critical movement is to influence individuals and societies through educational experiences that move beyond knowledge acquisition to support the development of ‘ethical and critically reflective competencies’ (Sterling, 2004, p. 55). Such experiences are grounded in the core ideas of progressive education and educational transformation. (Cortese, 2003; Sterling, 2004; Moore, 2005; Garcia, Kevany et al., 2006).

Experiential learning theory (ELT) was developed by David Kolb (1984) on the premise that “learning is the process whereby knowledge is created through the transformation of experience” (p.41). He developed a structural model of ELT and a

typology of learning styles that have been applied to understanding how knowledge is acquired through different academic disciplines and fields of work (Kolb, 1984).

According to Kolb, John Dewey's progressive approach to education "best articulates the guiding principles for programs of experiential learning in higher education" (1984, p. 5). This approach was founded on the premise that "active, social engagement in meaningful activity" provides the means for learning through contextualized experience (Kolb, 1984, p.5). In addition, he cites Vygotsky's contribution to experiential education through his theory of social constructivism. This theory describes how students collaboratively build new knowledge from existing knowledge. This perspective provides a basis for applying experiential learning to educational and professional situations (Kolb, 1984).

Transformative Learning Theory (TLT) is a conceptual framework of adult learning and development, through which adults actively engage in the epistemological questioning of how we know what we know (Dirkx, 1998; Mezirow, 2000). The theory builds upon the ideas of ELT that describe the construction of knowledge through meaningful experience. TLT focuses on the *interpretations* of the meanings of these experiences and how they lead to informed action (Mezirow, 2000). Transformative learning requires an ability to shift our mental narratives and meaning perspectives through the higher order cognitive processes of critical- and self-reflection that often occur through discourse (Dirkx, 1998; Merriam, 1998; Mezirow, 2000). Through these processes, adults may establish "new, more reliable and meaningful ways of knowing" (Mezirow, 2000, p. 19), which include "more inclusive perceptions of the world" (Dirkx, 1998, p. 4).

Transformative learning is a response to the pedagogical approaches to sustainability education that focus on process as well as content, requiring the implementation of interdisciplinary, collaborative, and experiential educational practices (Corcoran and Wals, 2004). Moore (2005) explains that such constructivist practices will provide room for inquiry, dialogue, reflection, and action about the concept and goals of sustainability, so that students will have the opportunity to engage in critical self-reflection and a shared construction of meaning. Through these formats for learning, students work toward developing competencies needed to engage in democratic civic participation of a global nature (Sterling, 2004). Such a global citizenry, rooted in a “culture of sustainability” (Gadotti, 2003, p.205) provides possibilities for changes in ‘habits of mind’ or ‘points of view’ and the creation of new patterns of behavior toward the environment, from the individual level through groups and to society as a whole (Moore, 2005, p.82). Transformative education thus attempts to “shift concern and perception in wider society from ‘single-issue environmentalism’ towards a holistic realization of the economic, social, and environmental interdependence of issues” (Sterling, 2004).

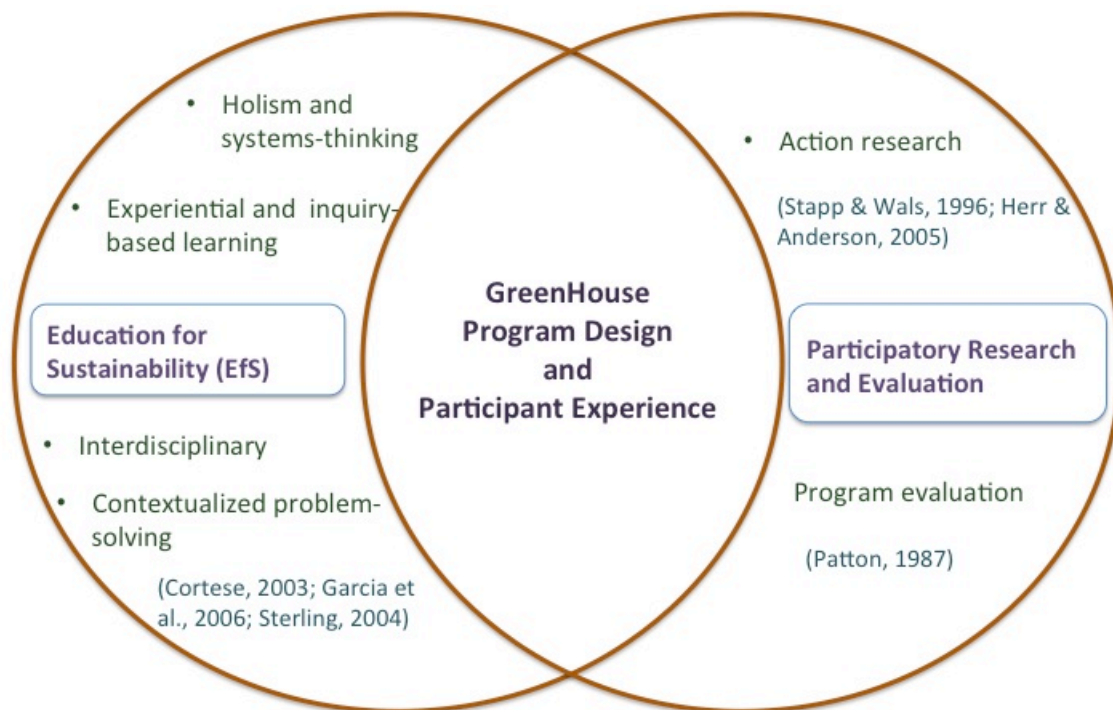
4.3. METHODS

4.3.1. Research Context

This project tests these learning theories at two levels of praxis, pedagogical and organizational. These praxes, associated with Education for Sustainability and participatory evaluation, link reflection to action. (For a visual depiction of this case

study, see Figure 4.1). The project is housed within GreenHouse, a large-scale sustainability-themed residential learning community. It is located within the University Heights residential complex on the UVM campus, where many sustainability initiatives are being tested.

Figure 4.1. GreenHouse Case Study Description.



As the land grant institution in the state, UVM places great emphasis on a combination of research, education and outreach to support the health and resilience of Vermont’s ecosystems and economies. Vermont offers an ideal setting and scale to link students through service to the broader communities surrounding the university so that they may engage in learning about the socio-political and ecological realities that shape their environment. This allows students to have real-world, firsthand experiences that

better prepare them to serve as active citizens responding to the dramatic changes that are shaping our world. One innovative way in which interdisciplinary environmental education is being woven into an undergraduate learning model at UVM is demonstrated through the GreenHouse Residential Learning Community Program.

Residential Learning Communities (RLC) are a new branch of the original Living/Learning programs at UVM. These programs began in 1973 to serve as an academic resource, creating an environment for students to integrate their academic and artistic studies and their residential experiences, and to provide a venue for faculty and students to interact outside of the classroom. RLC-wide goals at UVM have been established based on the work of the Association of American Colleges & Universities, who defined essential learning outcomes for undergraduate education in their 2005 campaign, *Liberal Education and America's Promise* (Association of American Colleges and Universities, 2008). The outcomes, listed as follows, are in agreement with UVM's strategic objectives: 1) An interdisciplinary understanding of (and hands-on experience with) inquiry practices that explore the natural, social, and cultural realms, 2) Intercultural knowledge and collaborative problem-solving skills, 3) A mindset that fosters integrative, critical thinking and the ability to transfer skills and knowledge from one setting to another, 4) A proactive sense of civic and social responsibility, and 5) Strong written and oral communication, technology, and leadership skills for success in college and beyond. GreenHouse was established in 2006 after its design in 2005 based on these AAC&U outcomes.

GreenHouse is one of UVM's five RLCs on the campus and provides programming for students from a range of majors. The RLC has grown from serving

approximately 180 to 250 students within a residence hall housing 400 students.

GreenHouse learning objectives were formulated based on the broader RLC learning outcomes and include the following seven concepts: 1) ecological literacy, 2) sense of place, 3) community service, 4) ecological design, 5) ecological footprint, 6) reflection, and 7) leadership. Guiding its design is a program focus on place-based educational activities, many of which encompass the pedagogies associated with Education for Sustainability (EfS). This “place-based education” brings students into local or regional community contexts, where stewardship is encouraged and civic engagement is part of the curriculum (Sobel, 2004). Sobel describes education as a preparation for citizenship, wherein students serve as productive community resources. Learning goals associated with place-based experiential learning and service range from intellectual to civic and career goals and promote learning about social issues associated with these educational contexts (Jacoby and Associates, 1996). These ideas are in line with the intentionality principle that guides the GreenHouse effort to achieve place-based environmental literacy with its student population.

All GreenHouse students are selectively admitted into the program based on a program application, including students who are admitted into the following first-year embedded communities: the Integrated Study of Earth and Environment (ISEE) through the College of Arts and Sciences and the Lola Aiken Scholars (LAS) through the Rubenstein School of Environment and Natural Resources (RSENr). Each of these two programs for first-year students are learning community models with an academic focus on environment and sustainability, providing students with access to faculty and peer mentorship, small seminar classes, and priority housing in GreenHouse. Combining their

coursework with residential activities fosters interaction among students and faculty that share a common academic interest. The learning format involves guest speakers, field trips, and interactive discussion led by senior faculty. These communities are study subjects as are the required courses, capstone courses and guilds.

The two one-credit course requirements for all GreenHouse residents are the primary means for GreenHouse residents to become ecologically literate. The one-credit course requirement for all incoming GreenHouse residents was designed to promote active community involvement and personal reflection as these students transition into the program. It consists of sessions designed to help residents understand the community structure—from facilities design and program activities, to the nesting of UVM within the greater Winooski watershed region. The course requires students to attend sustainability-themed events that help them identify topics of interest for themselves. They engage in reflection on these experiences before writing an “action plan” that guides their second semester engagement in the program. The one-credit course for returning GreenHouse residents builds upon the introductory course to provide mentoring support and leadership opportunities for students who wish to work in small groups to pursue sustainability projects. In addition to these courses, partnerships with ENVS and RSENr situate capstone course experiences in EfS in GreenHouse, and students are exposed to elements of “campus greening,” such as energy reduction and sustainable food systems initiatives. A capstone course example is “Environmental Problem-Solving,” which links students with GreenHouse staff so that they lead programming and provide support for community events. Campus greening experiences are organized by GreenHouse staff in collaboration with other campus outfits and/or

through student interest groups, or *guilds*, formed within and by GreenHouse students. Mentors for GreenHouse guilds include members, alum, faculty, staff, graduate students, or external community partners. Guild leaders determine when, where, and how often to meet, and further schedule activities for their members. (For a list of guild offerings, see Appendix E.)

This case study research addressed two research questions. The first question focused on sustainability education within GreenHouse, and the second question focused on GreenHouse program development. The following are the two research questions for this research case:

- 1) How are the principles of Education for Sustainability (EfS) reflected in the program design and participant experience in the GreenHouse Residential Learning Community at UVM?
- 2) What is the value of incorporating participatory research and evaluation processes into this residential learning community context, and how do these processes serve the program's development?

4.3.2. Research Approach

Applied social research methods were employed to analyze GreenHouse, using the reflective and responsive action research (AR) and Utilization-Focused Evaluation (UFE) approaches. These approaches allowed me to complete an in-depth, critical description of the program model, emphasizing the influence of its pedagogical format on students' co-curricular experiences. I brought an emic educator-researcher perspective to

this process, serving as both a program specialist on the staff, focused on program design, implementation, and assessment, and as a doctoral researcher focused on program development through participatory evaluation. My perspective allowed me to lead program stakeholders through processes that generated program theory and linked this theory to Education for Sustainability (EfS) in order to verify program processes and to consider further testing.

Methods for completing this evaluation included mixed qualitative and quantitative methods for both formative and summative analyses. The formative evaluation was intended to guide program improvement, whereas the summative analyses were intended to assess program success. To begin, I engaged in a process evaluation aimed at understanding the internal dynamics of program operations and collected data for formative evaluation. I collected ethnographic field notes and performed a review of historical documents and open-ended written items on questionnaires. I also conducted in-depth, open-ended interviews. Interview sampling strategies utilized for this study included purposeful sampling for information-rich cases and homogenous samples to describe particular subgroups in depth. These data were triangulated through the grounded theory approach to content analysis. This inductive approach to content analysis was described by (Patton, 1987; Yin, 1993; Maxwell, 1996) to involve compilation and organization of data using selective coding strategies into major themes. The themes that emerged from my data were returned to stakeholders through both formal and informal meetings with staff and students, and through design charrettes that brought stakeholders together for reflective discourse as part of our action research. These measures were intended to assure that the results adequately represented

stakeholder views. As a methodology, these *member checks*, described by (Fetterman, 1998) and Maxwell (1996) serve as a triangulation strategy, reducing validity threats. This strategy is crucial to action research processes, which encourage evaluation, reflection, and action to occur concurrently in a “process of praxis” (Stapp & Wals, 1994, p. 38).

4.3.3. Phase One: Institutional Evaluation and Measures of Success

This investigation measured the success of the first two years of the program. Such an evaluation had been woven into original RLC design during its inception in 2005. In response to the formal plan to assess the program’s success, the RLC Director engaged with me in this research. To begin, he and the Vice President for Enrollment Management, crafted a letter to the University President and Provost & Senior Vice President reiterating to them the plan for comprehensive assessment outlined for RLCs and requesting their input into the research inquiry. Their administrative response indicated most interest in learning of the differences in completion, retention and grade point average (GPA) rates between students who participated in GreenHouse compared with those who did not participate in an RLC program. Further, the university administrators were interested in learning about students’ satisfaction with the RLC experience. For program stakeholders with high levels of direct involvement (faculty, staff, students and RLC administration), increasing student engagement throughout the program became the central topic of interest for this portion of the study.

Quantitative analyses of completion, retention and academic success rates were focused on First-Time, First-Year (FTFY) students. Completion rates refer to the

percentage of FTFY students in GreenHouse who successfully completed their first year of college, and retention rates refer to the percentage of FTFY students who returned to UVM for a second year. GPA was measured based on the students' first year of schooling at UVM. I compiled GreenHouse enrollment data for the Fall of Academic Years 06, 07, and 08 for these analyses, and we worked closely with the UVM Office of Institutional Studies to complete analyses of our enrollment data to determine these rates, comparing our residents with all FTFY students across campus. Both quantitative and qualitative data were collected from year-end surveys from the first three years of the program (Academic Years 2007-2009). These annual online surveys were conducted in Perseus to obtain feedback for programming and to assess program goals based on students' perceptions of their experiences with the program. Although response rates were low for the first two years of the program, I was able to triangulate the quantitative data with qualitative responses to open-ended items and likert-scale statements on these questionnaires with focus groups to determine trends.

In order to better understand students' experiences with the program, we conducted focus groups with students who had been members of GreenHouse during the first two years of the program. Based on a distribution list of all students enrolled in the first two years of the program, we crafted an e-mail request to potential participants (See Appendix G). Twelve students responded, agreeing to participate in focus group discussion during the spring semester of the third year of the program (Academic Year 2009). In addition to the two focus groups, I conducted seven additional semi-structured student interviews. Interview questions were collectively determined by GreenHouse administration and staff, and informed by GreenHouse students (See Appendixes H-I). In

addition to the notes that were taken during interviews and focus groups, these discussions were audio-recorded and transcribed for use in selective coding for emergent themes grounded in participants' stories and perceptions.

4.3.4. Phase Two: Action Research and the Student Experience

Further exploration of the curricular model and its relationship to EfS consisted of four design charrettes. These charrettes involved selectively inviting program stakeholders to discuss specific design issues and solutions to program challenges. This method was used to integrate multiple stakeholder perspectives into an inclusive dialogue addressing design challenges so that all representative viewpoints could collectively produce action-oriented outcomes. The purposeful stakeholder selection was intended to equitably represent various stakeholder perspectives. (For stakeholder representation, see Table 4.1). The following sequence of topics were addressed by the four charrettes: 1) overall community engagement, 2) second year program engagement, 3) integration of academic and student affairs programming for community engagement, and 4) systems thinking as a tool for program development.

Table 4.1. Phase Two: Design Charrette (DC) Stakeholder Representation.

	RLC Faculty/ Staff	Residential Life Staff	RLC Admin	GH Students	Resident Assistants (non-GH)	External Stakeholders	Total
DC 1 3/27/09	3	1	2	5	1	3	15
DC 2 3/24/11	4	0	1	4	0	4	13
DC 3 3/21/12	3	2	2	8	2	1	18
DC 4 4/26/13	6	0	1	2	0	2	11

Each charrette followed a similar process, with slight variations to their design based on the principal content of the charrette. The process involved an introduction to the program and exercises directed toward systematically thinking about GreenHouse design. Participants were divided into small-group discussions around specific design challenges, and the ideas discussed in these “break-out” groups were returned to the whole group for further discussion, feedback and for action planning.

Toward the end of this second phase of our research, we reviewed the program’s mission and goals, determining the program’s guiding principles and considered them in relation to four broad EfS principles: 1) holism and systems thinking, 2) interdisciplinary understanding of ecological systems, 3) emphasis on active, experiential and inquiry-based learning, and 4) contextualized problem-solving within communities. We also completed an initial GreenHouse Logic Model, a template that demonstrates our program resources and activities and their intended impacts for meeting short-term and long-term goals. We wanted to link long-term impacts with our mission and guiding principles to inform how we would further develop program components, such as the required program courses. The final portion of this second phase included the fourth design charrette, focused on systematic program development through use of our new evaluative tools.

4.3.5. Limits to Study

This research case represents a universe of residentially-based and co-curricular cases in higher education that are interested in educating for sustainability. It addresses the possibilities and challenges associated with linking place-based ecological literacy to

co-curricular, “high-impact” practices, albeit within just one large-scale residential program within one residential hall on one campus. Due to the focus on EfS, the results that follow may not be applicable to other RLCs. However, aspects of this research effectively illustrate relationships between scale and leadership within this unique community. Additional limits to this study include the potential for bias that exists based on my combined role as both a staff member and a researcher within GreenHouse, and limits associated with the data. There were variable levels of participation during each of the four design charrettes and survey response rates were low. Through the grounded theory approach to data analysis, I attempted to reduce validity threats associated with these limitations.

4.4. RESULTS

Results from this study are reported chronologically, beginning with Phase One: Institutional Evaluation and Measure of Success and progressing through Phase Two: Action Research and the Student Experience. These results represent data collected and analyzed over a period of five years (2009-2013). Phase One reports data that measures institutional program success based on measures of student retention, return and academic success for the first two years of the program. It also includes analyses of mixed methods data to determine emergent themes from surveys and interviews. These three themes provide a framework for presenting the results: 1) Sense of Community and Place, 2) Experiential and Action-Oriented Approach, and 3) Personal Development and Shared Values. Phase Two results extract information from the series of four design

charrettes, building on the three themes that emerged during Phase One. Slight variations in the third and fourth charrettes resulted in the additional elements of: a) diversity and inclusivity, and b) reactions to the participatory nature of AR and UFE, respectively. The variation to the third charrette was the focused integration of academic and student affairs to build community within the entire residence hall, whereas the variation to the fourth charrette involved the use of our new logic model tool for program analysis.

4.4.1. Phase One: Institutional Evaluation and Measures of Success

This portion of my study stemmed from the need to determine program effectiveness following the first two years of program implementation. The data from this part of the study came from: a) analyses of enrollment data for the first two years of the program, b) analyses of student responses to year-end surveys from the first three years of the program (Academic Years 07-09), and c) six interviews and two focus groups held in the spring of 2009 with students who had participated in the first three years of the program (Academic Years 07-09). In addition to our analysis of program effectiveness, this research phase provided an initial exploration into determining areas of interest and concern for future program study. It served as a pilot phase contributing exploratory information into establishing themes for further study.

4.4.1.1. Perseus Year-End Surveys

All students were asked to respond to annual year-end surveys over the course of the first three years of the program. These surveys were conducted using the Perseus program. Response rates to these surveys were as follows: 21% for AY 07 (37 of 176

students), 33% for AY 08 (67 of 204 students), and 22% for AY 09 (50 of 227 students). (See tables 4.2a-4.2d below for demographic information describing survey respondents for these first three years of the program.) Although response rates were low, I was able to triangulate these data with data gleaned from 17 students and two GreenHouse faculty members who participated in interviews and focus groups.

Table 4.2a. Demographic Survey Information: Academic Rank

Academic Year (AY)	First Year Student	Sophomore	Junior	Senior
AY 07	54.1% (20)	29.7% (11)	8.1% (3)	8.1% (3)
AY 08	40% (26)	43.1% (28)	10.8% (7)	6.2% (4)
AY 09	40.8% (20)	42.9% (21)	16.3% (8)	0.0% (0)

Table 4.2b. Demographic Survey Information: Total Years As UVM Student

AY	1 Year	2 Years	3 Years	4 Years
AY 07	59.5% (22)	27.0% (10)	8.1% (3)	5.4% (2)
AY 08	50.8% (33)	40.0% (26)	6.2% (4)	3.1% (2)
AY 09	67.3% (33)	28.6% (14)	4.1% (2)	0.0% (0)

Table 4.2c. Demographic Survey Information: Identification

AY	American Latino/ Alaska Native	Asian American/ Pacific Islander	Caucasian/ White	Multiracial	Other	Not Answered
AY 07	2.7% (1)	8.1% (3)	86.5% (32)	0.0% (0)	2.7% (1)	NA (0)
AY 08	1.6% (1)	0.0% (0)	95.2% (59)	1.6% (1)	1.6% (1)	NA (5)
AY 09	0.0% (0)	0.0% (0)	97.9% (46)	2.1% (1)	0.0% (0)	NA (2)

Table 4.2d. Demographic Survey Information: Gender

AY	Female	Male	Not Answered
AY 07	62.2% (23)	38.7% (14)	NA (0)
AY 08	62.9% (39)	37.1% (23)	NA (5)
AY 09	72.9% (35)	27.1% (13)	NA (1)

4.4.1.2. Institutional Studies Assessment: Completion, Retention and GPAs

Although not statistically significant, results from our collaboration with Institutional Studies determined that the completion, retention and GPA rates for First-

Time, First-Year (FTFY) GreenHouse residents were higher, in comparison to these rates for all FTFY students at UVM, for academic year 08. These results indicated that FTFY students in GreenHouse fared well in these areas in comparison to all FTFY students at UVM during this second year of the GreenHouse program (See Table 4.3. Comparison of completion, retention, and GPA rates.).

Table 4.3. Comparison of completion, retention, and GPA rates.

Academic Year 2008	GreenHouse	All First-Time, First Year Students
Completion Rate	98% (107 students)	95% (2,450 students)
Retention Rate	90% (107)	86% (2,450 students)
Grade Point Averages	3.19 (107 students)	3.01 (2,450 students)

4.4.1.3. Student Interviews

GreenHouse was designed for lower division students, who were required to live on campus during their first two years of schooling at UVM. Seventeen total students interviewed for this portion of my study, either individually or through focus groups. Of these students, 14 were Rubenstein School of Environment and Natural Resources (RSENR) students who were majoring in either Environmental Studies (ENVS) or Environmental Science (ENSC). This data shows high proportions of ENVS/ENSC students participating in the study based on the open invitation to all students, and further demonstrates how these students were the most likely to engage with the programming. These were the students who demonstrated most interest in supporting the success of the program, as they tended to be the most highly engaged students during their tenure. The remaining students were from either the College of Engineering and Math Sciences or Education. Nine of the RSENR students participated in the Lola Aiken Scholars (LAS) program. LAS students were placed in a housing cluster in the S2 portion of the building,

which was only partially filled with GreenHouse members. Most of these students moved into S1 for their second year with the program, where the majority of GreenHouse residents lived. Their experiences with the program, based on LAS participation and their placement within the building, are reflected in the interview data. From Phase I, the following three themes emerged from my data to describe students' experiences with this program: 1) sense of community and place; 2) experiential and action-oriented approach; and 3) personal development and shared values.

4.4.1.1.1. Sense of Community and Place

GreenHouse students placed importance on the sense of community that developed within the program. They indicated the following essential characteristics for a positive sense of community in GreenHouse: 1) the opportunity to meet and interact with others interested in environment; 2) a friendly place to live that challenged them to live ecologically; 3) opportunities for hands-on engagement in ecological living (preferred over classroom-based learning); and 4) opportunities to develop a greater sense of place by learning about the local environment. The “sense of place” theme also refers to students' perceptions of their experiences with space allocation within and surrounding the residence hall, and to their programmatic experiences within the surrounding Burlington and Winooski Watershed regions. Issues related to facility design, and to perceptions of shared residential spaces, were raised.

Characteristics of the UHS building that housed GreenHouse had a great impact on the students' sense of community within GreenHouse. The segmented format of the building contributed to the structural challenges that inhibited a strong sense of place in

GreenHouse. The building was divided into three sections (S1, S2, S3). S1 and a portion of S2 were occupied by GreenHouse residents. The student respondents who lived in S2 described a feeling of being disconnected from S1, where: a) there is a community kitchen, b) the GreenHouse offices were located, and c) a communications board was located. The suite-style housing structure, which housed four students in each suite, enabled the students within a suite to develop relationships, yet students living in four-person suites felt that they were isolated from the remainder of the community due to: a) a fire door requirement and b) the placement of stairwells. The fire doors, which led to the hallways, were required to be closed, and the stairwells were located in positions that discouraged community building beyond a particular building segment. The kitchen spaces and convenient outdoor green spaces were identified for their community building value, as were the community events that occurred regularly within them. GreenHouse events often occurred on the green roof, and residents were fond of studying, conversing, or playing music under the shade of a large maple tree located in green space just south of the building.

Embedded communities in GreenHouse consisted of small-scale, academic groupings of students. These community sub-groups were supportive of students' academic progress because they linked coursework with residential learning community experiences. The embedded Lola Aiken Scholars (LAS) and Integrated Study of Earth and Environment (ISEE) groups strengthened and deepened the students' awareness and understanding of environmental issues and provided the opportunity for them to support one another academically. Students enrolled in these programs indicated that these communities, with their high concentrations of Environmental Studies and Rubenstein

School of Environment & Natural Resources students, had a positive effect on their academic performance. For instance, a LAS student “lived” his major “instead of just studying it,” which he linked to “improved grades.” A second student commented positively about being surrounded by people taking common courses, who could offer her help with coursework. In addition, they found that GreenHouse programming was often directly related to their classwork, providing stability for focusing on their major coursework.

Based on the common interests and experiences LAS students shared as residents, GreenHouse helped these students develop long-lasting friendships. These interests and experiences included: environmental issues awareness, companionship while walking to school, and participation in the Powershift youth climate movement in Washington, D.C. Within this embedded community, a LAS student commented on lasting friendships made within GreenHouse. She stated that she remained friends with 75% of the people that she had lived with in GreenHouse after moving off-campus. Similarly, several students stated that the majority of their close friendships developed during their participation in the program.

Overall, GreenHouse was described by residents as a community oriented toward doing well in school, with approximately 90% of survey respondents agreeing that they were satisfied with the program. However, they indicated the need to better utilize the facilities’ spaces to support a GreenHouse community identity. They suggested more student-designed art within the building, and they suggested more open-door events that encourage them to leave their suites and meet others on their floors and throughout the residence hall.

4.4.1.1.2. Experiential and Action-Oriented Approach

Students who entered GreenHouse sought an action-oriented approach to building knowledge and skills related to sustainable living practices. Multiple students expressed interest in learning to reduce their ecological footprint through a “green lifestyle,” the term used to refer to sustainable living practices in GreenHouse, and 96% of GreenHouse survey respondents expressed that they had learned more about environmental issues as a result of living in GreenHouse. They indicated that they had learned about sustainability, a “green lifestyle,” how to make a difference, and how to help others make a difference. In addition, approximately three-fourths of GreenHouse respondents indicated that they agreed with the statement that GreenHouse had helped them “to understand/look at social issues from a variety of perspectives.” They discussed the idea of a “broadened point of view,” stating that through hands-on learning, with like-minded individuals with similar values, they were able to broaden their understanding of the environment, of human impacts on the environment, and of solutions to human-created environmental problems.

Students described the links that were made between their course studies and their co-curricular GreenHouse experiences, many of which took place during the evenings and on weekends, providing insight into their perceptions of their personal development arising from program participation. For instance, an ENSC major described enhanced learning and pro-environmental behavioral modifications based on living around and listening to others interested in environmental issues. Further, a second student described how GreenHouse encouraged active community engagement and development of community values. An engineering student explained that he had expected to learn more about environmental issues through his classes, but he found the curriculum to be focused

primarily on civil engineering during his early coursework. He described how the Green Design Guild (a mentored, student interest group in GreenHouse) “synchronized” his classes and learning community experiences as a first year student.

My review of the curricular elements associated with GreenHouse revealed that the required one-credit and optional courses, and the embedded communities, provided valuable experiences for GreenHouse residents (for more information about GreenHouse curricular elements, see Table 4.4.). In GreenHouse, the one-credit course requirement for first-time residents encouraged students to attend a wide range of events that they may have not otherwise attended, and respondents indicated that they placed value on these direct experiences. Ninety-one percent of student respondents indicated that GreenHouse encouraged them to attend events and/or activities that they might not otherwise have attended. One student explained that the course structure encouraged participation, which was valued because “GreenHouse would instigate good thought and learning both on and off campus.”

Table 4.4. GreenHouse Curricular Elements.

Required Course/ Embedded Community	Students Participants	Core Concepts/ Topics	Learning Community Description	Pedagogical Praxis
NR15: Ecology of Place	First-Time Residents (approx. 100)	Place-Based Ecological Literacy	Self-paced; faculty, staff, and peer mentorship that promotes active involvement and personal reflection as students transition into the program	Reflection seminars; Community gatherings; Small-group projects; written reflection
NR16: Ecological Citizenship	Returning Residents (approx. 100)	Active Citizenship through Skills-Based Learning	Mentoring and leadership opportunities; faculty and staff support for environmental projects	Skills-based seminars on topics of interest; oral and written reflection
NR99: Aiken Scholars Seminar (Lola Aiken Scholars)	RSENR First-Year Students with outstanding academic records	Environmental issues, leadership, and service	Seminar course and clustered housing in GH	Reflection seminar; mentoring relationships; independent study; community-based projects
Integrated Study of Earth and Environment	20 First Year Students in CAS	Questions and Methodologies for studying the Earth and environment	Four linked classes in Geology, Geography, and History; reflection seminar; guest speakers	Foster faculty-student interactions; mentoring relationships

The optional course for all returning residents encouraged leadership through mentored experiences, which have been shown to support not only skills development among students, but also to support the emergent nature of GreenHouse programming that follows the interests of both students and faculty, alike. The offering also supported continuity within the program, as students tended to enter and leave the program in two-year cycles, engaging in this course during their second year. Student feedback from

focus group discussion pointed to the optional course for returning residents as a motivating factor for taking on leadership within the program. For instance, they discussed how the course resulted in the creation of new guilds. Guilds refer to student interest groups in GreenHouse (for a list of guilds, see Appendix E). The more recent addition of the GreenHouse garden was initiated by a student project from this course that was mentored by the program directors. By extending and transforming this project into a senior thesis project through the Environmental Studies Program, this student was able to navigate his garden design project through the university planning office, where it was approved upon completion of Fall 09.

4.4.1.1.3. Personal Development and Shared Values

Contributing to sense of community and place was the high level of value placed on events identified as “meaningful” within the community. One interviewee referred to GreenHouse as a space that “developed a personal and community identity.” This identity was formulated through active student involvement in meaningful program activities, such as events that brought students together through hands’-on engagement around a common place-based interest, such as woodworking. Events were cited as meaningful for their ability to: 1) “get people together to talk about what’s going on,” 2) allow students to share talents and to experience mentorship, and 3) provide opportunities for students to “find a sense of place and have the opportunity to learn outdoors.” (For further examples of meaningful activities, see table 4.5.)

Table 4.5. Meaningful GreenHouse activities.

Community Activities	Activity Examples	Why Meaningful?
Whole community gatherings	Harvest Celebration	Off-campus, community-building event held outdoors
Guilds	Conscious consumers, composters, mushroom & spore hunters, ecological design	Student-directed activities focused around a common interest
Student-initiated gatherings	Sunday night gatherings, village potlucks, open mic	Student-directed activities that support community cohesiveness
Field trips	Spring sugaring, apple-picking	Hands-on, educational activities in nature that are unique to the region
Lectures and presentations	Maple forestry, master composting	Content of interest to students; focused on regional (place-based) concepts
Workshops	Table-making, cooking/baking, knitting	Hands-on experience that brings students together around a shared interest; often place-based
NR16: Ecological Citizenship (optional course for residents returning for a second year with the program)	Food systems, woodworking, Yoga & mindfulness	In-depth and skills-based (hands'-on) exploration of content of interest to students; often place-based

The Harvest Celebration was highlighted as meaningful for students because it took place off campus, at the restored West Monitor Barn in Richmond, Vermont. The event focused on building community one month into the fall semester. It did this by engaging students in the following mentored experiences: a) a local foods meal preparation, b) field trips within the Winooski watershed (eg. Winooski River canoe trip and visit to Huntington Gorge), and c) an Open Mic. In addition to university faculty and staff mentorship, peer mentoring was a strong component of this experience. Capstone students from a course on ‘environmental problem-solving’ acted as mentors through their service-learning projects for the course. Through this course, and in collaboration

with GreenHouse staff, they designed workshops and field trips for the event.

Having exposure to new ideas and “trying new things” led some students to seek new experiences. For instance, one alumnus described how his involvement in “work days” at the student-run Common Ground farm led him to a summer farm internship in Maine. He emphasized how he would not have considered this type of internship had it not been for his experience that connected him with Common Ground through GreenHouse. Another student, an education major, described her participation in preparing local foods, composting and “green art” were new and valuable experiences for her. A third student returned to her high school ecology club to help establish a recycling program after having lived in GreenHouse for a year. Each of these students attributed their interest in trying new things to their GreenHouse experiences.

4.4.2. Phase Two: Action Research and the Student Experience

GreenHouse engaged in a series of four “design charrettes” that spanned a course of five years, each of which took place toward the end of an academic year. These charrettes were intended to utilize an action research approach to focus program development on design-based problem solving around areas of concern. Stakeholder representatives (students, faculty/staff, administration and community partners) explored design characteristics through these charrettes in order to determine action steps for program improvement. In addition to the three themes that emerged from Phase One of this research, a new element emerged in Phase Two, Charrette Three that focused on the concepts of diversity and inclusivity within the hall. This focus emerged from an attempt to better align programming and share resources between the student affairs (Residential

Life) and academic affairs (GreenHouse) programs within the residence hall. During Phase Two, Charrette Four, reflections from participants included a focus on the participatory development processes of this research as well.

4.4.2.1. Design Charrette One: Student Engagement within a Place-Based Community

The first design charrette, coordinated by GreenHouse Faculty Director in collaboration with a RSENLR Lecturer, took place on March 27, 2009. As the primary facilitators of the charrette, they engaged the GreenHouse community in discussion around particular design attributes discussed in their article, “Revitalizing Natural History Education by Design” (Kolan and Poleman, 2009). GreenHouse program stakeholders then applied our understanding of these and other educational design principles to GreenHouse program development by discussing program aspirations, tensions in our aspirations, and design challenges.

Design Charrette One Questions:

- 1) What are our greatest aspirations for this community?
- 2) Are there tensions in our aspirations?
- 3) What are the design principles that guide GreenHouse? Given specific principles, which ones resonate? Where is the tension? What is missing?
- 4) Given our aspirations, tensions, and challenges, how will we get to where we want to go?

4.4.2.1.1. Sense of Community and Place

Charrette participants overwhelmingly agreed that the more students feel connected to community, the more likely they are to become engaged in it. These participants desired a better understanding of students' time commitments to GreenHouse, given academic program requirements woven with the social fabric of the community. Participants articulated that through leadership development that involves alumni, through links to nature, and through provision of safe space for exploring interests associated with community values, a strong sense of community would be stabilized. In order to develop leadership of this type, the group engaged in extensive discussion around a "village" concept (geographic arrangement of students within the residence hall) as a way to encourage greater student engagement and accountability and to achieve outcomes. The intended effect of this structure would be to increase the positive impacts of GreenHouse on students' experiences without increasing its financial resource investment. Students would benefit from the dialogue, comfort, safe space, creativity, leadership and mentoring occurring within the community.

The "village" structure, of small-scale embedded communities (16-20 students) within the larger GreenHouse community (~250 students) was proposed during the final "action planning" portion of the charrette. This structure was based on the architecture of the building. A word of caution arose regarding the possible segregation of villages that could result from this change. It was suggested that the program retain whole community attributes, such as whole community gatherings and guilds focused on students interests, while encouraging distinctiveness between villages. These villages would foster opportunities for healthy competition and encouragement, as well as offer a more

deliberate and consistent pathway to connect staff and students. By purposefully combining first year students with returning GreenHouse residents within each village, and by offering more organizational meetings and floor-based activities earlier in the year, residents would have greater opportunity to get to know one another. Within this village context, student participants emphasized the importance of having these be food-centered activities—with an ecological focus on food production and consumption. The idea of inviting students to return early in the fall to serve as “village leaders,” preparing for community involvement alongside faculty and staff, offered a creative way to inspire residents to become actively involved. With a more formalized staff role in “calling people to action” through multiple methods of communication (bulletin board, listserv, word of mouth, etc.) and connections to leaders, the village structure would have power to engage students who lack intrinsic motivation to participate in programming.

Staff was deemed critical in supporting student engagement throughout the community. Students indicated that the community needed staff to “lay a foundation,” “provide reinforcement,” and “build awareness” around student project ideas. Here, they addressed the two-year, cyclical nature of the program, when students transitioned into the program, developed leadership capacities and pursued projects, then moved to live off-campus as new students entered the program. Program administrators raised concerns pertaining to the level of staff intensity required to implement these proposed programmatic changes, particularly with regard to monitoring and sustaining two concurrently functioning village and guild systems. Overall, the group determined that having the two structures in place would work if the guilds were “ad-hoc and self-perpetuating” without a lot of staff involvement. Further, they believed that villages

would encourage creativity outside of the confines of guilds.

4.4.2.1.2. Experiential and Action-Oriented Approach

Building more opportunities for service into the program was a core theme for discussion. Participants believed that villages were a good idea and that each village should have a service requirement, holding the students accountable for activity within and between the villages, and through which student-generated activities and responsible action would stem, “like a vine spreading out into the community.” There were questions around the format that service would take (eg. course requirements or large-scale community projects). Program staff was curious to discover how to more effectively encourage and support student inquiry. From their perspective, certain types of programming, such as field trips, could more readily be modified to include service. Suggestions for successful service in GreenHouse included implementing a service-learning reflection model and involving alumni to handle increasing numbers of student projects. Alums could initiate and drive projects, giving back to the community beyond their tenure as residents. It was agreed that service could take the shape of ecological, cultural, or community-based service, engaging students in service to the UVM and greater Winooski watershed communities. In relation to service, student leadership needed to be further cultivated so that students became prepared to create and run programs, or to sustain programs, allowing for greater levels of peer engagement within the community. Advantages from increased student leadership emerged from the discussion, including: 1) an increased commitment to the Green Lifestyle through student-generated programming, 2) successful partnerships between GreenHouse leaders

and Resident Assistants to share community-building responsibilities, and 3) alleviation of resource pressures caused by limited faculty and staff time allotted for program support. The role of student leadership would be to inspire students to take advantage of programmatic opportunities, to help them create their own opportunities within its programmatic structure, and to hold them accountable for their participation.

4.4.2.1.3. Personal Development and Shared Values

GreenHouse was deemed a safe space for exploring interests associated with community values, such as links to nature; yet, questions arose around how to create space for such meaningful engagement—so that students could organize and run events and maintain existing program features, such as the GreenHouse garden. (For examples of meaningful village-scale activities, see Table 4.6.) This was of particular interest given the growth in size of the community from 180 to approximately 250 students. This portion of the first charrette discussion in 2009 revolved around the influence of limited program resources, given the community's large size and pedagogic structure, on student engagement. Specifically, the group addressed faculty and staff involvement, embedded communities, and course requirements. Group concerns regarding faculty and staff involvement addressed: a) their ability to provide meaningful programming to students given its growth in size; b) the need for balance between faculty-led and student-led activities and mentoring; and c) the challenge of engaging students in service *to* the GreenHouse community, rather than providing services *for* them. In addition, consideration was given to the role of embedded communities, such as LAS and ISEE, in addressing issues of appropriate community size and student accountability. Embedded

communities served as formal connections to academic units, so a faculty member suggested that GreenHouse administration consider more structured collaboration with RSENr through the LAS program, and further consider the benefits and costs associated with having such embedded communities within the program. Another topic that crossed the resource-use and student engagement quandaries included having GreenHouse serve as a pilot for student-driven learning, existing of credit-worthy projects that could lead to substitutions and flexibility for the traditional curriculum. For instance, the provision of increased opportunities for credit-bearing projects and activities that build academic standards into the process, and that could alleviate some of the time pressures associated with combining GreenHouse involvement with academic course requirements. For instance, it was suggested that the two required GreenHouse courses could “replace” existing college requirements.

Table 4.6. Students’ examples of meaningful village-scale engagement.

Village-Scale Events	Village-Scale Activities	Why Meaningful
Leadership Seminar	Establishment of norms and identities; Event Planning	Building leadership skills through community development
Welcome Picnic	Orientation	Begin to develop a sense of place within community at the outset
Potlucks	Food preparation and sharing	Building skills and developing community through food
Harvest Celebration	Service; GreenHouse traditions	Annual partnership with Vermont Youth Conservation Corps and festivities at the Monitor Barn

4.4.2.2. Design Charrette Two: Sense of Place and Active Second Year Engagement

The second design charrette was coordinated by two RSENr graduate students, including myself, in collaboration with an undergraduate GreenHouse alum who served

as an intern with the program. The charrette took place on March 24, 2011. We engaged the GreenHouse community in systems thinking and concept-mapping activities to generate programming ideas targeted toward students returning for a second year with the program. Participants collaboratively selected three design areas on which to focus: 1) community partnerships, 2) policy for second year engagement, and 3) leadership for personal development. Information was generated during small-group discussion, and a “re-design” session followed that focused on action planning for the following year.

Design Charrette Two Questions:

- 1) What are our aspirations for second year student involvement in the program?
- 2) Are there tensions in our aspirations?
- 3) Given our aspirations, tensions, and challenges, how will we get to where we want to go?

4.4.2.2.1. Sense of Community and Place

The major focus of this discussion revolved around whether or not to further structure and ultimately require the optional course available for all returning GreenHouse residents. Concerns related to this shift arose, with particular concern targeting how this change would impact the sense of community in GreenHouse. Staff members were uncertain how students would respond to the new course requirement and were curious to see if it would reduce student involvement in the independent study option associated with the course. Further, they questioned impacts on relationships between faculty, staff and students and on the capacity of faculty and staff to carry

through with the requirement. Participants recognized that resources would have to shift alongside this structural shift in programming and generated ideas for core structure, content and pedagogy if the course were to be made mandatory. Suggestions included: 1) requiring peer and self-evaluation, 2) hiring a TA or providing a stipend for the additional work, and 3) housing the majority of course information on the community website. Suggested seminar formats included a “students-teaching-students” model or a “service-learning” model that engaged students in reflection. Suggested themes for seminars included leadership, energy and food systems. To cultivate more collaborative service projects for GreenHouse residents, the program would partner with campus resources for service learning.

4.4.2.2.2. Experiential and Action-Oriented Approach

GreenHouse program structure was described as flexible, encouraging co-creation by students alongside faculty and staff. Legacy (archiving, documenting, and visioning) was identified as one way to engage students in this malleable program format in meaningful ways. Ultimately, a leadership requirement would begin to build this legacy, archiving community projects, activities and community needs. Leadership development efforts would be incentivized and would take place through workshops and seminars as part of the new course requirement for returning residents. Applied leadership would: a) encourage the early establishment of community norms, b) integrate new program leaders with GreenHouse alumni, and c) connect students to projects and mentors external to the program. The leadership program would occur before the first year students arrived and would quickly involve second time residents before they became distracted by other

activities. It would consider the geographic or physical arrangements of students in GreenHouse villages, having students co-design these spaces, conduct village-based contests, and prepare shared meals in an effort to support one another's social well-being and provide support for academic success. A student leadership model that had yet to be defined would be woven into this physical structure so that intentional mentoring of the first-year students by second year students occurred.

4.4.2.2.3. Personal Development and Shared Values

In order for students to deepen their sense of place in GreenHouse during their second year with the program, they desired authentic, relevant experiences that would extend or broaden their worldviews. Experiences of this type would focus on “depth not breadth,” as they would select a topic to pursue in their second year with the program—building upon their first year exposure to many topics of interest. These experiences would ideally be interdisciplinary field studies that aim to involve students in service learning, connecting action with purpose. By engaging in meaningful experiences (see Table 4.7 for examples of experiences deemed meaningful to second year students), students would be offered opportunities to develop a deeper connection to and identity associated with the GreenHouse community. Reflection was identified as a crucial theme for the course for second-time residents in order to link student vision and action to the concept of “making a difference” in the world. It would allow them to set personal and collective goals for themselves. They would consider their own roles, responsibilities and accountability for program participation and consider how GreenHouse fits into their personal goals. They would further consider their contributions toward community

success. From an administrative perspective, reflection would provide those responsible for implementing the course requirement a direct link to students, providing greater insight into students' visions for their experiences in GreenHouse. For instance, building a reflective practice component that targeted service-learning into the course would allow students to communicate purposeful learning. Students would be connected to outside mentors and projects and would reach out to first year students through GreenHouse projects and events. The students would further be asked to reflect on: a) a foundational set of readings, b) the relationships between their GreenHouse experiences and their greater UVM experiences, and c) on any influences that GreenHouse may have had on their future interests or pursuits.

Table 4.7. Examples of meaningful second-year experiences.

Village-Scale Events	Village-Scale Activities	Why Meaningful
Village-scale service activities (eg. river clean-up)	Invite first-time residents to participate in a service activity	Purposeful integration of first and second year residents to build community through environmental interests
Village-scale community-building activities	Potlucks, competitions, field trips	Purposeful engagement of first-year peers in community-building activities
NR16: Ecological Citizenship	Connect skills-based learning to internal/external mentors	Reinforcement for interest-based learning in community
	Focus on current events	Brings relevance and real-world contextualization to community
	Leadership and Advocacy training	Builds an autonomous community with a distinct identity

4.4.2.3. Design Charrette Three: Residential Diversity and Inclusivity Focus

This charrette was organized by the University Heights South Resident Director in collaboration with the GreenHouse Faculty Director to focus on the integration of Residential Life (student affairs) and GreenHouse (academic affairs)

programming in the University Heights South residential complex. These two program administrators and leaders decided on three charrette questions. These questions were aimed to respond to the need to better integrate programming to support a diverse and inclusive community, building upon the student affairs strengths in social justice programming and the environmental focus of GreenHouse. The charrette took place on March 21, 2012. Charrette topics covered the village structure, specifically addressing the experiences of students in “unprogrammed” portions of the building, and requested ideas for course and leadership opportunities in GreenHouse.

Design Charrette Three Questions:

- 1) Given what we know about the experiences of those who live in UHS who were not part of GreenHouse, are there ideas about how to make this a more integrated living experience? Namely, should we expand the size of each village, so that they align with the Residential Life community structure?
- 2) There are currently formal leadership positions (Resident Assistants, Village Leaders, and EcoReps) in UHS. Given this structure, what’s working? What’s not? How could we be more integrated?
- 3) Which topics and skills should be addressed through the required course for returning GreenHouse residents?

4.4.2.3.1. Sense of Community and Place

The topic of community size and scale had been a regular topic of consideration among GreenHouse staff as the program had grown from 180-250 students. This

charrette provided the opportunity to gain feedback from multiple program stakeholders regarding whether to increase or decrease the size of GreenHouse within the 400-resident hall in order to create a more diverse and inclusive environment. The second issue of scale that was addressed was whether to increase the size of GreenHouse villages to align them with the community designations defined by Residential Life. The third topic to consider with the increase in village size was the idea of mixing students from the embedded LAS and ISEE communities with other GreenHouse residents. This was an important consideration due to the plans for a third embedded community for Academic Year 2013. “MOSAIC,” comprised of students from the College of Agriculture and Life Sciences (CALS), would involve student representation from the seven CALS departments, encouraging students to learn outside of their disciplines, exposing them to multiple, interdisciplinary ways of thinking. The primary advantage cited for increasing village size would be to arrange the villages by floor, which could reduce student confusion over the two existing programmatic structures and their differing leadership models. Further, in order to inform the topic of community size and scale, students described their experiences within GreenHouse villages, sharing issues they faced as well as ideas for improving the existing format. Specifically, students indicated that the village structure wasn’t “emphasized enough” and a lack of inter-village student interaction was noted. First-year students in the LAS program pointed out that they identified with their third floor location rather than with their village orientation. This discussion led to suggestions for further developing the village structure in order to build a stronger sense of community. These included: 1) increasing the number of required village meetings early in the year, 2) targeting village identity development, 3) grouping

students by special interests or guilds, and 4) deepening village-level commitments to a “green lifestyle,” by systematic engagement in topics that students feel passionate about (eg. energy and food). For instance, participants agreed that students should be required to take part in a village-level, rotational composting schedule. All of these suggestions were deemed important for further developing an inclusive community.

4.4.2.3.2. Experiential and Action-Oriented Approach

GreenHouse administration was curious to see how the newly required course for returning students would increase their program participation, particularly through building mentored student leadership into the course. According to the Program Director, it was encouraging to see that 90% of first year students chose to reapply to GreenHouse, given the additional course requirement. They also wanted to know how well the pilot course offerings addressed sustainability topics. In particular, there was question around how well the course seminars targeted the equity and economics pillars of sustainability, areas that could possibly be enhanced through Residential Life collaboration. While student participants didn’t respond directly to the focus on sustainability, two students described the seminars as “effective” for encouraging student interaction around shared interests, without excessive pressure to perform for a grade. Blogging exercises and other forms of social media were suggested to enhance the course, as these reflection and communication methods helped people meet one another. It would be up to the program administration and staff to determine how to weave these forms of reflection into a greater course focus on sustainability issues in order to increase second year student participation in meaningful ways. In order to address the topic of student leadership, the

Residential Life leadership model was shared and compared to the GreenHouse Early Birds program (the initial GreenHouse leadership structure that invited students to return early in the fall to support community-building efforts early in the year). In comparison, the Resident Assistant (RA) role for Residential Life was clearly defined and compensated, and held the students responsible for knowing their residents and tracking trends that occurred on their floors. An RA described the positive identity that formed around these roles and tasks, based on small group work that formed friendships. Several stakeholders reiterated how accountability for leadership is hard to hold when there isn't compensation—and suggested credit-bearing recompense as an effective means to hold students accountable for leadership in GreenHouse. GreenHouse would also create “anchor suites,” of four returning students living together to intentionally support community-building efforts early in the semester that would “radiate” throughout the community. Utilizing an enhanced understanding of the core functions of the Residential Life leadership model, GreenHouse would further develop its own leadership program.

4.4.2.3.3. Personal Development and Shared Values

A portion of this charrette revolved around complex-wide issues associated with creating an inclusive community. In University Heights South housing, both GreenHouse and “unprogrammed” students were housed within the same residential hall. With 40% of the hall consisting of unprogrammed residents, and an architectural structure that caused isolation throughout the building, the administrative question arose around how to deliver appealing programming for 400 residents while creating a unified sense of belonging within the building. There had been a long-standing issue within the

Residential Life community around whether it would be “fair” to have a “sought after” building completely programmed by a residential learning community. In addition, a GreenHouse resident expressed the ongoing concern focused on program dilution due to the fact that many students wanted to live in the new, LEED-certified hall because it was a nice place to live, rather than for the opportunity to interact with others around the environmental interests of GreenHouse. He described his perception that many students did not share a passion or excitement to be there for sustainability-themed programming and shared commitments. Given these challenges, stakeholders raised suggestions for increasing an inclusive sense of community throughout the hall through meaningful community-wide events (see Table 4.8).

Table 4.8. Suggestions for building an inclusive community through meaningful events.

Community-wide events	Activities	Why Meaningful?
More frequent, structured events	Food traditions	Brings complex of students together and builds traditions
Integrate required course for first-time residents into complex-wide programming	Restructure the course to include a second-semester, action-oriented component.	Encourages an action-orientated student participation focused on students' shared interests.
GreenHouse Leadership Model	Event planning	Builds leadership skills through a focus on students' interests.
Provide inclusive, complex-wide events that don't necessarily address concept of sustainability	"Open Doors" and "Open Mic"	Encourages student interaction throughout the residence hall.
Combined Residential Life and Greenhouse events	Events that integrate social justice and sustainability themes associated with these programs.	Allows both programs to maximize use of financial resources to meet goals.
Offer complex-wide invitations to GreenHouse events	Use social media for event advertising	Builds a more inclusive communication structure throughout the hall.

4.4.3. GreenHouse Program Planning & Evaluation Tools

Prior to design charrette four, a portion of the research consisted of building upon the inclusive and participatory action research processes that occurred throughout Phases One and Two to develop a logic model that articulated program theory for GreenHouse. To begin this phase of program development, I worked with the remaining GreenHouse administration and staff to review and update our mission statement. The following is the revised statement:

GreenHouse is a residential learning community that seeks to promote ecological literacy and sustainability, instill a deep sense of place and foster a holistic appreciation for human and natural environments. Through active engagement in our programming, community members from a diverse array of backgrounds and disciplines strive to cultivate an inclusive and supportive living and learning environment.

Once the staff had agreed upon the revised mission, we discussed our program's guiding principles. These principles informed our work as we designed programming. We agreed on the following principles to guide GreenHouse program development:

Education for Sustainability

- Holism and systems thinking
- Interdisciplinary understanding of ecological systems
- Emphasis on active, experiential and inquiry-based learning
- Contextualized problem-solving within communities

Diversity

- Inclusive of diverse identities
- Inter-, multi-and trans-disciplinary

Intentionality

- Provide structure and accountability through self-paced and skills-based learning activities
- Offer “high impact” activities, such as first-year seminars and field-based experiences, which bring groups of students together with staff to share common intellectual experiences (Kuh, 2008).

GreenHouse faculty and staff developed a logic model template that outlines program resources, activities, outcomes, and impacts, based on the process outlined in the Logic Model Development Guide: Using Logic Models to Bring Together Planning, Evaluation, and Action (Kellogg Foundation, 2004). The process engaged administration and staff in systems-based discussion of program components in order to outline program goals and activities. Using this approach, a visual model was created to serve as a tool for further assessing the program’s alignment with its mission and goals, and for planning and reflecting on programming. Developing the logic model occurred over a series of staff meetings, dedicating time to discuss each of the program’s activities, including required courses, embedded program communities, student leadership and community celebrations. Time was allotted between meetings for staff to work in pairs to create portions of the model that were then shared with the entire staff for feedback. The following template demonstrates a condensed version of the GreenHouse logic model (see Table 4.9).

Table 4.9. GREENHOUSE LOGIC MODEL

Resources	Activities	Outputs	Outcomes	Impacts
In order to accomplish our activities we need the following:	In order to address our problem or asset we will accomplish the following:	We expect that once accomplished these activities will produce the following evidence or service delivery:	We expect that if accomplished these activities will lead to the following changes in 1-3 then 4-6 years:	We expect that if accomplished these activities will lead to the following changes in 7-10 years:
RSENR faculty instructor, staff support, peer mentors (service-learning, interns) Funding for student projects	<u>NR15: Phase I (Understanding Place)</u> Introduction to GreenHouse concepts (Green Lifestyle)	orientation to GreenHouse community, UHS facility and grounds, and Winooski R. watershed / landscape	community involvement; orientation to place; positive social climate; increased retention/return; improved GPA	Place-Based Ecological Literacy, Active Citizenship
	<u>NR15: Phase II (Exploring Place)</u> Exposure to a wide range of sustainability-themed programs	directed personal inquiry oriented toward sustainability & environment, whole community events	Community identity with roles and responsibilities, Expand sphere of influence (individual to global)	
	<u>NR15: Phase III (Action Planning)</u>	Action Plan Essay and Debrief Session	Community needs assessment, development of action-oriented skills	
	<u>NR15: Phase IV (Action)</u>	Implement action plans, community event presentation & reflection	Enhanced skills: organizational, reflective, evaluative, communication	
GreenHouse base budget, RSENR course instructor, Ecological Design funding, Instructional Incentive Grant, community/faculty/peer mentors, ENVIS interns	<u>NR16: Ecological Citizenship</u> 10 seminars (100 enrollees) Skills-based themes or independent study with core readings, reflective practice, and Web interface	Thematic skills-based learning: food, water, transportation and energy systems, ecological design, natural history, yoga and mindfulness, and hands'-on skills (eg. Woodworking)	Seminar completion by return residents, role modeling and work with first year students, Improved presentation skills, community-based service	Skills Development: Hands'-on and Intellectual skills for lifelong learning Civic engagement/ leadership skills Place-Based Ecological Literacy
GreenHouse base budget Courses and instructors, GreenHouse staff, community partners, facility space, student mentors	<u>Embedded Programs</u> MOSAIC (College of Agriculture and Life Sciences), ISEE (College of Arts & Sciences), Aiken Scholars (Rubenstein School of Environment & Natural Resources) Honors College	Clustered housing, NR15: Ecology of Place completion Community event participation	Strong sense of community and place, active leadership, multi-disciplinary exploration, engaging role of discipline in creating a sustainable community, GreenHouse re-application	Academic Success Place-Based Ecological literacy Agency within real-world communities
GreenHouse staff mentor for leadership seminar, ResLife collaboration, peer mentorship	<u>Village leadership</u> Village meetings (geographic and scalar), first-year advising, community event participation, personal leadership development	GreenHouse community orientation and participation, social networking, cohesive community, increased collaboration with ResLife	Enhanced leadership skills, vibrant community, improved grades, Increased program participation	Place-Based Ecological literacy Active citizenship Academic success
GreenHouse staff and peer mentors, financial resources for student projects	<u>Guilds (student interest groups)</u>	Increased autonomy and skill-sharing, Student-driven leadership and community building	Enhanced hands'-on, critical-thinking and leadership skills, positive community climate, active participation around shared interests	Active Citizenship Tools for Lifelong Learning Enhanced Cultural Capital
GreenHouse base budget, administration and students, community partners, Sodexo, NR206 service-learning students	<u>Community Celebrations</u> Whole community gatherings with food	Four community events per semester	Enhanced sense of ecologically-minded community, Participatory: event planning with students, alumni participation, capstone projects	GreenHouse legacy Alumni network

4.4.3.1. Design Charrette Four: Strategic Systems Thinking for Program Development

This charrette was collaboratively designed by two GreenHouse Program Specialists, myself included, to inform how we would further develop our program activities in relation to our goals. To begin the charrette, I reviewed our research that stemmed from Phase Two of this study with program stakeholders before we asked them to participate in a ‘World Café’ exercise to generate ideas for program development. The charrette took place on April 26, 2013 and targeted three programmatic areas: 1) the required course for returning students, 2) village leadership, and 3) embedded first-year student communities. We further divided the 12 participants into action planning groups to begin preparations for Academic Year 2014.

Design Charrette Four Questions:

- 1) Given our experiences with the required course for returning residents, what works? What doesn’t work? How can we better structure the class and the learning process? What seminar topics can be addressed through this course?
- 2) How can village leaders support first-time, first-year residents enrolled in the required course for first-time residents and help build their village identities?
- 3) How can we distinguish embedded communities from the “regular” GreenHouse community, and draw on their differences to build a cohesive community? How can we collaborate with academic units to support embedded communities?

4.4.3.1.1. Sense of Community and Place

GreenHouse students deemed the community size an important issue to address both because of its large scale and because the resulting community culture was difficult to navigate. A student leader commented that the large community size made it difficult to know why students chose to live there—which, in turn, made it difficult to navigate between what students did to meet requirements vs. what they accomplished out of motivation to be involved. First-year students had to traverse a new physical and social landscape as they entered the program without prior knowledge or experience with the components, identities, roles and building structure that made up the complex culture of the place. Clarifying roles among the diversity of people involved in the program was a prominent issue. Given the fact that villages were intended to provide important leadership structures for the program, it was determined that through: a) maximizing the strengths of student leaders, b) networking with staff and others in authority, c) clearly communicating with the student body, and d) through “catalyzed problem-solving,” they could help the community “coalesce.” According to a majority of the group, generating a more thoughtful philosophy about what the village structure intended to do to create community cohesion would better help GreenHouse accomplish its cohesivity goal, given scalar challenges. With respect to the embedded first year communities, which were described to blur into their villages, it was suggested that GreenHouse support a cultivation of their identities. With the expected addition of two new embedded communities for AY2014, half of the 120 incoming first year students would be members of these smaller communities. Their identities would be tied to their academic programs and would be clearly expressed throughout the larger GreenHouse community.

Participants generated suggestions for developing the MOSAIC program, and embedded communities in general, that included: a) establishing fall reunions that invite academic advisors and administrators to attend, b) playing a service-oriented role in community celebrations that focus on sharing their experiences with the broader community (eg. through community potlucks), and c) creating an “identity installation” that describes their program (eg. a tile mosaic for the green roof that represents MOSAIC’s program identification). Ideas were further generated around the placement of these students, either mixed with other “non-embedded” GreenHouse students or combined in a village with another embedded community. Regardless of membership within these sub-communities or placement within the hall, students felt that building community would best occur through activities that link them to nature.

4.4.3.1.2. Experiential and Action-Oriented Approach

Students focused on their experiences with the required GreenHouse courses. Those who were just completing their first year course reflected on challenges associated with the self-paced aspect of the course. They believed that it required more structure through village leadership that would include personal interaction rather than relying on an online course communication structure. Charrette participants who were involved in the course for returning residents emphasized the need for a unified course focus that builds upon its common reading and reflective components to better connect students through the core seminar themes. They also provided numerous suggestions for course leadership, coordination and communication around course activities among the community. For instance, it was suggested that some course activities take the form of

common experiences and group projects that could be archived. An incoming staff member proposed that we provide students with an alternative that would integrate their coursework with another campus-based curricular or co-curricular project. GreenHouse could thus serve as a hub where students cultivate projects and carry them to other parts of the university.

During this charrette, there were additional reflections from students and staff on our participatory development processes. Two student leaders expressed their pleasure to see areas of student concern being addressed by the staff, indicating that small changes would make a big difference in program delivery. Staff members were contented to learn more about what had been working, what could be improved and where students' interests were headed, adding that room for space, creativity, innovation and emergence were positive aspects of the program's development work. The recent university graduate who was working to help develop the course for returning residents stated, "It's the ideal design experience," referring to its "open" and "exploratory" processes. He felt that with the recent acquisition of additional funding for ecological design in GreenHouse, there would be great potential for engaging in these processes to further design the program.

4.4.3.1.3. Personal Development and Shared Values

A portion of this charrette discussion revolved around "meaningful" experiences that should be further woven into existing GreenHouse courses (see Table 4.10). According to a student leader, further developing these courses would help first-year students who are "trying to navigate what college is all about." Along with suggested

tangible resources for orienting students, charrette participants agreed that community assemblies with food, and increasing face time between students and staff, would better support the first year students.

Table 4.10. Suggestions for course improvements, based on meaningful activities.

Course-Based Activities	Activity Examples	Why Meaningful
Nature-based/ Place-based activities	Village hikes	Connecting to one another through shared interests in nature
Focus on “cultivating community and exploring place”	“sustainability quest” or scavenger hunt	Orients students to surroundings, emphasizing aspects of green living
Create binders with information that depicts course themes, includes course outlines, and that defines tools and terms associated with the community	Student archives of community projects through photos and stories	Tangible resource for incoming students; Orients new students to community projects
Social marketing of the “green lifestyle” throughout UHS; Embedding “green lifestyle” concepts into course for returning residents	Utilizing courses to develop communication skills while educating others about sustainability	Links purposeful action to learning community goals in fun and engaging ways

Community leadership emerged as a theme that would help first year students navigate GreenHouse and engage them in meaningful activities within their community.

The discussion about community leadership focused two main areas: 1) leadership selection and 2) development of leadership roles. A need for greater clarity around the cyclical nature of leadership positions in GreenHouse was emphasized, as methods for identifying leaders were discussed. “Shoulder-tapping,” where current leaders approach first year students to suggest they would make good GreenHouse leaders, would take place as part of their recruitment efforts. In addition, active recruitment of student leaders through the community-wide winter event was perceived to be successful. One of

the representative community partners said that he preferred that we maintain two village leaders per floor to collaborate with the one Resident Assistant, suggesting that three people in leadership roles provides greater “chemical stability.” He further shared an analogy between leadership roles and certain animal attributes. For instance, the eagle represents “big picture thinking,” a mother bear represents the “nurturer” or “elder female leader,” and the robin serves as the “caller to action.” He wondered how we might utilize an understanding of these characteristics to support community development and leadership within the community. Overall, the group agreed that by developing an understanding of their own leadership strengths, through activities such as Strengths Quest, student leaders could better utilize their knowledge to: a) determine when to lead and when to follow or let others lead, and b) network with others with different knowledge, skills and perspectives (including staff and others in positions of authority). This would further “catalyze problem-solving,” helping the leadership group come together toward the intention of community unification.

DISCUSSION

Based on the findings of this research that revolved around three major themes, there are clear links to be made between Education for Sustainability and GreenHouse program development. In this section, I discuss these relationships from two vantage points. The first comprises a curricular standpoint focused on program design and impact assessment on student learning and development. I also describe how this research connects to the essential features of high impact learning in higher education. This

portion of the discussion leads to overarching aims for generating a critical mass on campus that focuses on educating for sustainability. The second point of view targets program evaluation. I discuss how the participatory program evaluation format that integrates action research with utilization-focused evaluation within this residential learning community context, responds to stakeholder interest in program improvement. For other programs desiring iterative input based on the findings of this research, I describe the advantages and limitations associated with the participatory nature of this study and provide research recommendations. I close the discussion by addressing the role of GreenHouse, and related co-curricular programming, in the advancement of sustainability in higher education.

4.5.1. Critical Review of Three Themes

The three key themes that emerged from this research include: 1) sense of community and place, 2) experiential and action-oriented approach, and 3) personal development and shared values. For each of these three themes, I'll review strengths and offer critiques of each. The first two themes link leadership in experiential and community-based learning with the physical and social structures of the residential learning community. Within these structures, there is great opportunity to maximize the integration of academic and student life. This integration holds potential to enhance the co-curricular learning nature of the program by intentionally linking the residential community structure with the principles and praxes of education for sustainability, to which social justice is intrinsically connected. The third theme focuses on the potential for GreenHouse to engage these residents in transformative learning that results in

ecological worldview shifts that could better align their attitudes and behaviors with an orientation toward sustainability.

4.5.1.1. Sense of Community and Place

While GreenHouse contributes to: 1) increased ecological literacy, 2) enhanced sense of place, and 3) responsible environmental behavior among its student body, achievements are limited by the two-year cyclical timeframe that transitions students into the program to develop a range of leadership and other skills prior to their transition out of the program. Given the time limitations associated with this cycle and the longer time horizon associated with acquiring ecological literacy, these findings show that program managers need to maximize efforts to further define and articulate specific, realizable curricular goals and match those goals with EfS pedagogy that moves students along a continuum toward lifelong ecological learning. For instance, first-year student engagement, driven by the required Ecology of Place course, leads students through self-paced, “place-based” explorations of their surrounding environments. The strengths of the course lie in the experiential opportunities that introduce students to concepts and skills associated with active citizenship. While place-based education that orients students to their college community is a clear strength of the program for first-time residents, structural course challenges identified in this study create barriers to engagement. To remedy this situation, suggested course modifications include more personal interaction between student leaders and staff—to lead students through the four self-paced phases of this course—and better alignment of reflective practice with activities deemed purposeful and meaningful by students. Both elements need attention

to increase connections between learning and experience and to deepen the relationships that support a strong sense of community and connection to place.

The community size and structure issue within GreenHouse continues to be a perplexing challenge to those administering the program—determining best practices to support a cohesive community structure of approximately 250 first and second-year students within a 400-student residence hall. This research shows that finding pathways for new students to navigate the program so that they feel comfortable and confident in their new home requires peer, faculty and staff leadership. This leadership requires articulation of the following: 1) clear purpose and structure for villages, 2) community norms that engage students in a green lifestyle, and 3) action-oriented opportunities to foster pro-environmental behavior within the community. Embedded communities, such as the ISEE and LAS groups in GreenHouse, are good examples of “high impact” practice that brings groups of students together by linking core curricula with staff interaction, resulting in shared intellectual experiences that have been proven beneficial to students (Zhao and Kuh, 2004; Kuh, 2008; Brownell and Swaner, 2009). They also offer some purpose and structure for the villages in which they are housed. However, there is a major concern that arises around distinctions between embedded programs and the broader GreenHouse community. Embedded community members identify positively with their nested programs, yet the extent to which they also identify with the overarching GreenHouse community is not clear. Identity conflicts could emerge if these small-scale groupings lack interaction with other students external to their embedded programs. If students can build and maintain identities associated with differentiated levels of scale, community cohesiveness could be cultivated at both village and whole-

community levels. Therefore, as program managers plan to have more first-year embedded communities comprise the makeup of the program, they will need to consider their strategic placement within villages and consciously cultivate an intellectual learning community at these dual scales.

4.5.1.2. Experiential and Action-Oriented Approach

In GreenHouse, leadership is critical for developing a strong sense of community and place by involving its members in explorations associated with nature. It further serves as the major pathway to achieving the long-term active citizenship goal associated with the program. However, this program component is still under development, as was noted during the series of design charrettes that emphasized a need for increased student leadership in GreenHouse—particularly, a leadership that engages students in service. At the pedagogical level, I have turned toward service-learning as a promising methodology for deepening student engagement in potentially transformative learning processes, as it could raise student awareness, understanding and an action orientation toward environmental crises by engaging them in authentic and relevant learning settings. Through their second-year seminar, linked with established community partners and resources, student leaders could identify, develop and lead service activities with support from GreenHouse staff, further developing intra- and inter-village service requirements that hold students accountable for action-oriented participation within community. These efforts would align well with the ideas of Jacoby & Associates (1996, p. 21), who state that “citizenship education” engages students in external, place-based service opportunities that enhance environmental literacy through reflection on the learning

experience. These course-based and community service efforts would create a situation in which service crosses the entire community and instills participation and action among community members, simultaneously strengthening the sense of community and place in GreenHouse while targeting place-based ecological literacy and active citizenship outcomes. Linking leadership to active citizenship among students aligns well with the ideas articulated by experiential learning theorist, David Kolb (1984), who described how reflection on service-learning allows students to link explorations in nature with concrete service experiences. Building on these ideas, I suggest that GreenHouse respond to the identified need for more structure within each of the required GreenHouse courses by weaving service into the required courses for first-time and returning students. For instance, Ecological Citizenship seminars for returning students could be transformed into a service-learning model that grounds student experience in reflection on interest-based topics, such as energy and food. Further, GreenHouse should advance existing partnerships with the Vermont Youth Conservation Corps and with Bread & Butter Farm so that they are more integrated with the required courses, and new partnerships could be forged at both the local and regional levels that further link service experiences with the concept of place. This would allow these residents to move deeper into content of choice, while maintaining an action-orientation that involves them in collaborative learning and reflection around a topic of importance to them.

Based upon my conversations with GreenHouse staff following the series of charrettes, I understood that they are currently formulating a more solid leadership development model. This model will transition from a single semester, credit-bearing option for returning students to a full year position tied to two units of credit in

GreenHouse. This year-long, cyclical nature that “passes the torch” from one year to the next, will involve leaders in recruitment and training of new leaders during their second semester, providing them with opportunities for peer mentorship alongside the incoming leaders. This model will begin by engaging student leaders in deepening their understanding of their own leadership styles and strengths before engaging them in community development processes. It will exist alongside the Residential Life leadership model, providing opportunities for collaborative efforts between the two that enhance community development within the residence hall. Roles will need to be clarified so that student leaders emphasize the student-initiated-and-driven aspects of community participation (such as guild creation) while reserving the staff “reinforcement” role for projects and activities. By further aligning village leadership responsibilities with required programming for first-time residents transitioning into the program, those students will have enhanced support for maximizing their sense of community and place as they transition into GreenHouse. One method of leadership delivery that is under exploration requires community members to attend village meetings headed by village leaders. These meetings could be designed to engage students in discussion that integrates the experiences of both first-time and returning residents while targeting and deepening commitments to the green lifestyle and to the service component of the program. This will create room for a greater number of students to envelop leadership skills that engender initiative for peer engagement and allows them to reflect on purposeful learning. Village meetings should further include documentation, linking leadership to community archives, and generating a legacy for GreenHouse.

4.5.1.3. Personal Development and Shared Values

According to John Dewey (1919), early educational theorist and leader in the progressive education movement, the “social environment forms the mental and emotional disposition of behavior by individuals by engaging them in activities that arouse and strengthen certain impulses, that have certain purposes and entail certain consequences” (p. 19). Given this idea, thoughtful educational design targeted toward specific educational experiences and learning objectives for GreenHouse students holds potential to engage them in transformative learning processes that create significant and desirable shifts in the worldviews and subsequent behaviors of program participants. They learn about sustainability by connecting shared values with experiences that help them develop a sense of place within their residential learning community. These are often hands-on and interest-based experiences that encourage them to try new things outside of their immediate GreenHouse community (eg. explorations of local food systems and regional watersheds) and that engage them in interest-based activities within the community, like sharing music and attending community assemblies with food. These experiences often involve mentorship for developing practical hands-on and communication skills associated with sustainability, specifically in areas of interest such as sustainable food production and consumption and with respect to recycling activities. These “meaningful” activities are seen as “personally significant in some way” and assist in the clarification of values held by the group (Dirkx, 1998, p. 9). They are the means through which students learn about sustainability in GreenHouse and are directly linked to experiential learning theory, which consists of a cyclical nature of reflecting on experience in order to further conceptualize and act upon new understandings that emerge

from them (Kolb, 1984; Kolb and Kolb, 2005). By engaging in reflective discourse around these cyclical experiences with their peers, their “habits of mind,” or broad assumptions, and “points of view,” depicted in their attitudes and values, may be altered in transformative ways (Mezirow, 2000, p. 17; Moore, 2005, p. 82). Meaningful experiences can be further linked to higher order thinking skills that help students broaden their systemic and participative worldviews; those that are identified as necessary by Sterling (2001) for developing of a culture of sustainability. Such higher order thinking can be cultivated by direct emphases on the praxes outlined in education for sustainability, namely through explicit and meaningful reflective discourse around shared experiences that touch upon shared values. In the case of GreenHouse, transformative shifts would be portrayed by an overtly ecological educational paradigm shift that demands a common societal response to the grand challenges of sustainability (Sterling, 2001). Sterling describes how such transformative shifts create a “postmodern ecological worldview” that enables learners to “feel ownership of their learning” based on “meaningful, engaging and participative, rather than functional, passive and prescriptive” experiences (p.27).

While there are clear pedagogical strengths associated with Education for Sustainability in GreenHouse (see Table 4.11), areas of improvement exist at the curricular level that could incorporate more meaningful events and activities into its programming. For instance, implications from the data suggest that GreenHouse could take steps toward more explicitly integrating opportunities for student inquiry into existing course structures. In line with the ideas of Jacoby and Associates (2006), by engaging the curiosity of the learners, heightened experiences that involve collaboration

and reflection among its members could result in deeper, more meaningful, learning. Dirkx (1998) discusses similar ideas about the learning process, yet emphasizes the importance of imagination and creativity in these processes and their integration with reflection and dialogue. Because the malleability of the program's structure is highly valued by all program stakeholders, interest-based, student-driven projects and traditions have been encouraged over the years, yet the extent to which this inquiry has been acted upon has been relatively low. In the past, student leadership cultivated a shared space for communication and creativity through "Sunday Night Gatherings," where students were invited to share openly about their experiences as UVM students and as GreenHouse residents. In addition, a few independent studies through the required course for returning students have been implemented, such as the development of the GreenHouse Garden, which has been integrated into the program's focus on food systems education. However, there has been little energy expended toward explicitly engaging students in direct inquiry through their required coursework. Results from this research suggest that the required course for returning residents could be further structured within an EfS framework to engage the curiosity of its learners through inquiry-based practices.

As the Residential Learning Community and Residential Life programs continue to strengthen their collaboration, a more focused integration of environment and sustainability-related GreenHouse themes with the social justice focus of Residential Life should be further explored alongside the increased collaboration around student leadership. These integrated themes of environment and social justice would enhance the service-related and contextualized experiences of GreenHouse members, combining programmatic resources to address more of the social aspects of sustainability issues,

such as those associated with environmental justice. By addressing these issues more explicitly within the community, students would be offered a safe space to engage in dialogue that addresses not only their personal experiences with topics of diversity and inclusivity but also address these topics in relation to broader sustainability issues—thereby further enhancing possibilities for transformative thinking and action.

Table 4.11. Education for Sustainability in GreenHouse.

EfS Principles:	GreenHouse Pedagogic Examples:	GreenHouse Evaluative Examples:	Areas for improvement in EfS Praxis:
Holism and systems thinking	Place-based educational format for first-time residents (nested experiences at multiple scales), Required seminars for returning residents target a systems-perspective	Participatory program development through action research (AR) and utilization-focused evaluation (UFE)	Integrating themes of environment and social justice through RLC/ResLife collaboration (eg. linking leadership and service)
Interdisciplinary understanding of ecological systems	Place-based field studies for first-time residents', Required seminars for returning residents	NA	Linking service to courses that contextualize community-based ecological learning
Emphasis on active, experiential, and inquiry-based learning	Place-based approach to ecological literacy, Leadership seminar, Reflective component of required courses	Participatory design that invites stakeholders to participate in program development (AR and UFE)	Incorporating inquiry-based learning into required courses and Integrating student leadership with inquiry-based learning
Contextualized problem-solving within communities	NA	Design charrettes involve stakeholders in AR	Linking critically reflective practices to service activities that address real-world issues and build problem-solving capacities

4.5.2. GreenHouse Hub within a Campus Culture of Sustainability

UVM serves as the land-grant college of agriculture within Vermont, a small but well-connected state. The following characteristics of Vermont provide opportunities for students to engage in EfS: 1) a strong reputation for political leadership and progressive policies related to environmental protection and social equity, 2) a vibrant entrepreneurial spirit, and 3) an ecologically complex setting, that provides a wealth of opportunity to engage students in place-based education that is relevant to a wide range of majors and disciplines. In addition, the campus community is small enough to be well connected internally and to participate effectively in productive relationships locally and regionally. The small-scale nature of UVM academic departments further enhances student-focused learning and access to faculty and peer mentorship. Given these scalar characteristics, GreenHouse should clearly link with campus organizations with well-established infrastructure for sustainability and service outreach efforts and experiential learning, namely with the Office of Sustainability and the Community-University Partnerships in Service-Learning office. In addition, UVM's Extension Program, Continuing Education and Office of International Education connect students with community partners in authentic learning scenarios that address real world challenges. Further, relationships with the Rubenstein School of Environment & Natural Resources (RSENr) and the Environmental Program (ENVS) should be deepened. RSENr houses an Office of Experiential Learning that links students with internships, service-learning courses, study abroad and applied research that are integral to high-impact learning, and ENVS offers an internship capstone option that links ENVS seniors interested in EfS to GreenHouse. In addition, relationships with the College of Agriculture and Life Sciences (CALS) should

be nurtured along with the development of the MOSAIC program stemming from CALS. Such on-campus partnerships establish clear pathways for students to engage with GreenHouse during their upper division experiences at UVM and offer opportunities to be directed toward active and experiential opportunities that will build upon their initial experiences in GreenHouse. Outreach is also central for several other units on campus. The missions of the Gund Institute, and the Transportation Research Center, among others, emphasize connecting research with real-world problems. These community-student connections could expose a wider range of students to engaged scholarship and transformative learning experiences that offer opportunities for a paradigm shift, a global worldview, or finding a stimulating career path. These linkages would strengthen the concept of GreenHouse serving as a hub for sustainability-related activity on campus, wherein students are offered a great diversity of flexible, relevant educational offerings that promote citizens and communities committed to lifelong learning, thereby directly connecting students to concepts and practices associated with sustainability.

GreenHouse residents tend to prioritize their participation in the social aspects of the program, which outweigh their time dedicated to sustainability-focused programming. I believe that this is in part due to the lack of synergy that connects GreenHouse to: a) curricular requirements connected to core courses within the academic disciplines, programs and schools on campus, and b) UVM's leadership in experiential and service learning and campus sustainability. First, by further developing a co-curricular educational framework that integrates GreenHouse coursework with current requirements, such as an option for meeting a General Education sustainability requirement that is currently underway via the Faculty Senate, GreenHouse would

maximize the nature of its programming that integrates academic and student affairs perspectives for a robust experience of student life. Second, GreenHouse research suggests that the program could serve as a hub that synergistically connects students, faculty and staff, through projects and undergraduate research, that further contribute to a whole-systems campus cultural shift emphasizing real-world connections and community problem-solving. GreenHouse would thus serve as a hub, aligning well with the suggested “Environmental Commons” outlined in the recent Envisioning Environment initiative that reviewed the capacity for UVM to remain and develop as a key leader in environmental research and education. Suggested in this report submitted to the University President and Provost was a physical hub to serve as a gateway for undergraduate activity in “Environment, Sustainability and Health.” GreenHouse would play a key role in the commons, creating space for: peer advising, information resources regarding research opportunities, internship listings, and study abroad, and information regarding the Office of Sustainability, CUPS, and Eco-Reps programs, seminar rooms for thesis defenses, gallery space for art displays, and a student lounge and cyber café. In these ways, the co-curricular character of GreenHouse activities would further contribute to the nationally known green campus culture at UVM. Central to these efforts will be the university’s ongoing commitment to the program and to a process evaluation that supports the program’s development within the university’s structure. By investing resources in GreenHouse, its central role in maintaining UVM’s “green” reputation will be ensured and the idea that GreenHouse initiatives can serve as a hub of activity that radiates throughout the campus and beyond will further define its role to the greater UVM community. Such a commitment would contribute to a shift at UVM that benefits

the campus community and beyond by providing students with enhanced opportunities to attain skills for lifelong democratic civic participation of a global nature.

4.5.3. Program Planning and Evaluation Tools

Experiences with community-based problem-solving through action research in GreenHouse induced positive effects on personal and group learning and development. These results aligned well with the processes described by Stapp & Wals, (1994, p. 139) that engage stakeholders in “recognizing a problem, setting problem objectives, working in groups, collecting, organizing and analyzing information, defining the problem from a variety of perspectives, identifying, considering, and selecting alternative actions to take, developing and carrying out a plan of action, coalition building and evaluating the outcome and the entire process.” Design Charrettes, like those undertaken in GreenHouse, demonstrate community-based problem solving at the program level and provide results for program development. For this reason, they were integrated as major components of our AR processes—as formal places to monitor problem solving strategies and review program objectives. These processes are inclusive and informative, building reflective capacity in an intentional way. The staff places value on information-sharing through this defined creative space, and students learn about development processes while becoming associated with them, allowing them to become direct participants in further aligning their program experiences with their own personal development goals. In this way, they gain a better understanding of the role and purpose of this type of process evaluation that occurs on their behalf. Of a parallel nature, student voice steers program management toward more efficient and effective systems that students could

then comprehend and navigate for themselves, as in the case of the two required courses for program participants. On a purely programmatic level, reflective capacity aids in the developmental use of the program's logic model as a tool for programmatic growth, as managers monitor the tides of student experience in relation to political shifts and responses, aligning program activities and outcomes accordingly.

Higher educational challenges exist that inhibit structural shifts and alignment toward a culture of sustainability. These challenges are embodied by the conservative characteristics of the system that create institutional inertia and comprise “immense buffers to change” (Elder, 2011, p. 9). For instance, systemic barriers to assessment at the institutional level include both funding issues and a long-standing history of negative perceptions associated with evaluation. In their “blueprint” for accelerating sustainability in higher education, Elder and Dyer (2011) recognized that “systemic change in higher education requires tackling many leverage points at the same time and in a collaborative manner” (p. 2) and concluded that higher education “needs an effective, strategic, and influential national movement that can provide resources and facilitate opportunities to work together and learn from one another” (p.9). Although there are indications that this shift is occurring through higher education organizations such as the Disciplinary Associations Network for Sustainability (DANS) and the Association for Advancement of Sustainability in Higher Education (AASHE), it is my belief that participatory evaluation serves as an important leverage point for change because it is highly geared toward program managers to find creative ways to integrate evaluative processes into programming structure and function. Participatory evaluative formats such as action research and utilization-focused evaluation lead to reflective capacity, particularly when

integrated as a way to serve as an iterative assessment tool and as a way to reflect upon EfS in higher education. Integrating these processes with the existing work of associations such as DANS and AASHE could further support a systemic shift in higher education for sustainability.

4.5.4. Limitations and Recommendations

There are clear benefits and challenges associated with this research that represents a universe of residually-based and co-curricular cases in higher education that are interested in educating for sustainability. These benefits and challenges are associated with the study's mixed methods format as well as in relation to my combined role as researcher and member of the program staff. Benefits include both its pioneering iterative and participatory nature that necessarily involves student voice, its ability to link data to institutional benchmarks that indicate levels of program success, and links to my familiarity with both EfS and with co-curricular aspects of the program that combine academic and student affairs. The major limitations were associated with data collection and involved issues with sample sizes and response rates, and also touched upon the challenges associated with my combined role.

Having a knowledgeable practitioner, familiar with both EfS and with participatory development processes, was a plus during the initial stages of the evaluation and for logic model development. The EfS framework provided the language to be able to help me define linkages between the program's guiding principles and program goals. It helped me to see where there are pedagogical gaps that could be further developed, depending upon the interest and capacity of those involved with the program. It also

worked well to have someone who is familiar with the co-curricular nature of the program, and with the integration efforts between academic and student affairs, conducting community-based investigation. My ability to understand and integrate the varying stakeholder perspectives into the study was beneficial to the program's development as I worked to create open space for communication, collaboration and trust to take place in a low-risk evaluation environment. On the other hand, a major research limitation associated with this research relates to my combined position as a staff member and researcher within the GreenHouse program. Although this position allowed for longitudinal analyses and in-depth study of the site, much more data was collected than was needed to complete this assessment. At times, it was also difficult to differentiate between naturally occurring organizational development versus what was occurring due to the process-oriented nature of this evaluation work. In addition, the combined roles created unclear boundaries around this work that appeared to be confusing to other administrators, faculty and staff stakeholders.

Student voice is critical for the development of co-curricular and residential community contexts. Although small sample sizes made up my interview pool, and I received relatively low response rates to questionnaire items, there is great potential for obtaining greater levels of student voice through qualitative, open-ended responses from both interviews and survey questions as well as through design charrettes. Data collected through surveys informs the types of questions to ask and topics to explore through design charrettes and affords program managers the opportunity to collect data at regular intervals. These characteristics allow for iterative feedback and in-depth exploration of identified problems within the community. Efforts could be streamlined by collecting

baseline data to select major themes for further study, and design charrettes could easily take an alternative format to bring in more student voice. In terms of the charrettes, it may not be necessary to hold them on an annual basis, although this worked well for our academic timeline. Nor is it compulsory to hold four of them in order to reach a place where a logic model tool is developed and tested. The charrettes could be woven into village leadership, having leaders guide residents through discourse to obtain more data from students. With data collection methods in place that ensure representative student perspectives, incorporating fewer students into design charrettes (or another systemic planning scheme) would be sufficient, while maintaining a balanced representation of stakeholders across the board. These ideas would also address the obstacle that is posed by the participation of only the most engaged students who have a desire to see the program succeed.

Institutional benchmarks that indicate levels of program success may be tracked through ongoing collaboration with the UVM Office of Institutional Studies. Tracking longitudinal data of retention, return and grade point averages, which are common measures of institutional success, allows the RLCs to link academic success data to RLC engagement or to a university curricular focus on EfS. If it can be demonstrated that RLCs are a good model to increase these rates, or to link diversity data in ways that promote a more diverse undergraduate student population, institutions will be able to include this information in their marketing and publication materials, possibly strengthening the institutional draw to the university. I would further suggest that RLCs keep records of demographic data that tracks a diversity of majors, disciplines, ages and ethnicities, creating profiles that track community proportions. This keeps a pulse on

who is drawn to an interest-based community focused on EfS, and can help actively direct programming to meet the interests of a diverse student population. These profiles can also help program managers determine activity necessary to build a more highly diverse and inclusive student community.

The major challenges to application of this evaluative model in higher education lie within systemic barriers. Barriers that have created obstacles and resistance toward program evaluation include: 1) limited funding sources, 2) emphases placed on research and tenure over curricular design and instruction, and 3) evaluation's historical focus on accountability. Despite organizational and institutional successes associated with participatory and action research, such as its common route to professional and institutional change in education, and its ability to allow program managers to weave development processes into ongoing work in ways that fit with time restraints associated with academic schedules, there are few resources to support such research, and it is difficult to embed into existing staff duties. One possible way to expand this evaluative format more broadly in higher education involves linking EfS to "high impact educational practices" (HIEP), in order to develop new and innovative models for a range of co-curricular and residential formats within higher education. These teaching and learning practices have been widely tested and shown to be beneficial for college students from many backgrounds (Kuh, 2008). HIEP include: 1) first-year seminars and experiences that bring together groups of students and staff to share common intellectual experiences, 2) curricular and co-curricular options linked to the core curriculum, 3) learning communities that involve students in taking two or more linked courses as a group that work closely with professors to explore a common interdisciplinary topic, 4)

diversity and/or global learning that is augmented by experiential learning and/or study abroad, 5) service-learning and community-based learning as field-based experiential learning with community partners, and 6) culminating internships or capstone courses. Kuh (2008) describes how each of these HIEP engages students experientially in ways that elevate their academic performance through enhanced levels of intellectual processing associated with higher-order thinking, such as information retention, integration and transfer. He recommends that all undergraduate students participate in a minimum of two HIEP, a first year program and one taken later in relation to their major field of study. If we can address the limitations of inadequate funding and focus on the benefits of incorporating participatory research into higher educational practices for sustainability, such as through links to HIEP, then we can further explore development processes through a participatory evaluative framework that is grounded in educational action research and utilization-focused evaluation, in order to develop and improve them in ways that are meaningful to all who hold a stake in them.

4.6. CONCLUSIONS

Although this research consisted of just one study at one university, there are a number of information bits that may support others targeting education for sustainability within higher education. The most prominent areas of information worth gleaning from this study include: 1) program characteristics that link leadership and service to education for sustainability in residential settings; 2) exploratory links between pedagogies of engagement and transformative education for sustainability; and 3) considerations for the

role of participatory evaluation formats of action research (AR) and utilization-focused evaluation (UFE) in education for sustainability (EfS) to serve as a leverage point for systemic change in higher education.

Given the large-scale nature of this student learning community, combined with its characteristic two year timeframe and highly desirable residential setting, it requires a high level of attention from both program management and student leaders to hold students accountable for their program participation. Effective ways to engage students are through the integration of embedded communities and villages, both of which arrange students in geographic groupings throughout the residence hall. Villages are strongly linked to community leadership, and leadership is the key link between active student engagement and achievement of the program's active citizenship goal. This research recommends that the smaller-scale learning community models of villages and embedded communities focus on community-based service, drawing from the successes of high impact educational practices (HIEP). One effective way to do this would be through a service-learning reflection model that addresses the challenging community size and structural issues associated with the physical aspects of the residence hall. It also combines well with the curricular elements of its programming, from required seminar courses and embedded communities to the optional and student-run guilds. The required curricular courses target place-based ecological literacy and active citizenship outcomes and engage students in reflection on personally meaningful and relevant activities. It also supports the development of higher-order cognitive skills, as well as personal development in the affective and behavioral realms that are regarded as essential to sustainability education. As stated by Shephard (2006) "educational outcomes related to

environmental sustainability involve knowledge, skills, and values that underpin sustainable behavior by business, government, and society” (p. 90). These smaller-scale communities within the larger residential learning community model create increased opportunities for engaging students in transformative learning connected to such cognitive, affective, and behavioral outcomes.

GreenHouse purports an action-oriented approach to knowledge and skills, engaging students in hands’-on learning associated with sustainable living practices; skills that Carlson (2012) describes for their ability to empower students to become more actively engaged citizens. Through this approach they are asked to consider how their behaviors influence the natural environment, and how they can share new knowledge and skills acquired through the program with others outside of their residential learning community. Through this type of engaged learning, they are introduced to concepts and skills associated with active citizenship, and they are offered opportunities to experience transformative shifts to their worldviews, attitudes and behaviors that lead to further identity development. A service-learning reflection model that would clearly connect reflection and action to these action-oriented experiences focused on sustainability issues. Further, service may be directly linked with student inquiry projects, enhancing possibilities for reflection on meaningful learning on topics of interest to them. Reflective practice is the key ingredient to mix with meaningful activities for educational transformation, as reflection offers the opportunity for values clarification among students and may be connected to their shared experiences. Ultimately, this type of service learning model supports program efforts to meet place-based ecological literacy and active citizenship outcomes.

Residential learning community programs such as GreenHouse that serve lower-division undergraduate resident college and university students are designed to provide a safety haven for undergoing personal development with others who share common interests and values. Concepts associated with sustainability, particularly ecological links to nature, draw them into sustainability education programming. Given a caring environment with respect for diversity, students begin to build community networks within which they discuss their programmatic experiences, enhancing opportunities for educational transformation. Given these program attributes, managers lead their organizations toward a more ecological educational paradigm defined by place-based ecological literacy and active citizenship parameters. Through reflection on multiple types of interest-based experiences, with emphasis on deep learning through required seminar courses, managers design environments responsive to the needs and interests of their student bodies. This type of educational environment relies on safe spaces for discussion about the difficult sustainability challenges associated with our present-day world systems. Further, this programmatic setting offers great opportunities to maximize use of programmatic resources by linking the Student Life and Residential Learning Community programs within a residence hall. This unique structure offers opportunities to link student, faculty, and staff leadership to place-based environment and sustainability themes that integrate with the social justice expertise of student affairs staff. This optimal environment for educational transformation associated with sustainability attitudes, values, and behaviors, contributes to the development of a sustainability culture through education for sustainability (EfS).

As part of the national sustainability movement in higher education, institutions

are targeting what Meadows (1999) termed, “leverage points” for change, within systems operations, research, and curricula. Participatory and action research have been proven to support organizational and institutional success by contributing positively to such professional and institutional change. As a leverage point and iterative tool, participatory evaluation allows program managers to measure the successes and failures of their innovations and mold them in ways that strengthen the academic success goal of higher education. It allows for a parallel level of organizational learning and transformation that occurs alongside student development. This research suggests developing sustainability education by linking the Education for Sustainability (EfS) framework to participatory evaluation, through action research (AR) and utilization-focused evaluation (UFE), in order to study and further develop educational contexts.

AR and UFE serve as professional and organizational development tools. They engage program managers and other stakeholders in program development through participatory processes that take the format of community-based problem solving. These processes are needed for achievement of institutional benchmarks, including those associated with campus greening and addressing sustainability in HEIs. There are few resources to support such research, yet ongoing assessment may be linked to high impact educational practices (HIEP), which have been demonstrated to actively and experientially engage students and elevate their academic performance (Association of American Colleges and Universities, 2007). More research should be done that connects EfS and HIEP to develop innovations that respond to institutional tides. Research emphasizing links between student learning and development that prepares societies to address dynamic sustainability challenges should involve studies of HIEP that address

cognitive, affective, and behavioral outcomes. Given the example of GreenHouse serving as a campus hub for studying and radiating sustainability, concentrated studies of HIEP alongside sustainability education frameworks would benefit the development of such an organizational and institutional hub.

AR and UFE address programmatic challenges, such as those associated with the two-year cyclical timeframe of student participation in GreenHouse. These processes allow program managers to review and assess program goals in relation to institutional ebbs and flows. Student inquiry that engages their curiosity, and service aspects of GreenHouse that target justice issues, would be excellent topics for participatory evaluation within the learning organization. These both connect closely with EfS and could further be connected to HIEP. Embedding this research praxis within the safe spaces that characterize the GreenHouse residential learning community model, offers opportunities to study the academic and student affairs connections to sustainability through social justice and environment connections. This allows for development that addresses diversity and inclusivity themes that are inherent to sustainability issues.

Diversity and inclusivity are concepts that underlie sustainability discourse across the disciplines. It is an area for further study that has been emergent within GreenHouse for a number of years. There has been question surrounding the capacity of the program to target the equity and economic pillars of sustainability as strongly as it targets the environmental pillar with its student residents. Two ways in which these concepts could be further incorporated into GreenHouse and into other EfS programming in higher education is through tracking of student demographic data and through greater collaboration between academic and student affairs personnel involved with these sorts of

programs. Diversity data serves as an institutional benchmark and may be utilized in tandem with participatory evaluation to track community diversity profiles in an effort to create programming that attracts more diverse student communities and adjusts programming to meet their needs. In addition to a more diverse student body within sustainability-related programs, the conceptual, active and experiential components that comprise such programs may be better aligned to address the equity and economics pillars of sustainability, areas that must be incorporated into the sustainability discourse to enhance possibilities for transformative learning and educational transformation.

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CHAPTER FIVE

DISSERTATION DISCUSSION

5.1. Pedagogical Praxis in Sustainability and Food Systems Education

Based on these case studies, I believe that the development of sustainability education (SE) with High Impact Educational Practices (HIEP) offers great opportunities for curricular development that achieves profound levels of student learning and development. (For an overview of the three SE frameworks utilized in my study alongside HIEP, see Table 5.1.) Education for Sustainability (EfS), Sustainable Agriculture and Food Systems Education (SAFSE), and Agroecology Education (AE) contextualize learning within broad learning communities that involve faculty instructors and community partners working with students. These learning communities of varying residential- and immersion-based scales address inquiry that involves the use of multiple epistemologies to make meaning of diverse contexts and worldviews for the purposes of transformative learning. Further, student-centered, facilitated experiences combined with reflective practice build skills for meeting societal needs. In addition to systems thinking and research skills, communication, technology, and leadership skills that support transformation are also achieved.

The engaged learning format of HIEP may be the way of the future for residential- and immersion-based sustainability and food systems education. This represents a big shift from early sustainable agriculture education, which was once a discipline-centric and science-based field. Residential and immersion-based learning in food systems and sustainability offer ideal environments for incorporating the broad

experiential and action-oriented pedagogical praxis of HIEP that attain positive and lasting student learning and development outcomes with students. These dynamic learning environments are a desirable typology for college and university students that rely on facilitated reflection to connect the passive and active aspects of immersion learning to deep levels of student learning and development. Through participatory evaluation involving action research (AR) and Utilization-Focused Evaluation (UFE), these contexts and frameworks hold great potential for curricular development of a wide range of courses and programs focused on food systems and sustainability. These development processes further offer professional development benefits for faculty instructors involved in their design.

Table 5.1. Sustainability Education and High Impact Educational Practices Overview.

Education Framework	High Impact Educational Practices (HIEP)	Education for Sustainability (EfS)	Sustainable Agriculture and Food Systems Education (SAFSE)	Agroecology Education (AE)
Focus	Engaged Learning	Sustainability in higher education	Civic agriculture and community re-localization	Education for Sustainable Development in agriculture
Approach	Experiential and action-oriented	Broad interdisciplinary application	Interdisciplinary concepts and methods	Interdisciplinary case studies; farm-based
Parameters	Connects action to reflection, often involving community partners	Broad inquiry into systems and sustainability	Focused inquiry on farms	Study of agricultural systems with defined boundaries
Goals	Increased student learning and development	Systemic change in higher education	Sustainability in agro-food systems	Sustainable agricultural development (global)

For course and program development in the field of food systems education, benefits are increased by the incorporation of two distinct pedagogical praxes that stem

from sustainability education. These praxes include: 1) interdisciplinary systems thinking in regional case studies, and 2) faculty-facilitated reflective practice that involves food justice topics.

In immersion-based food systems education, interdisciplinary systems thinking has an important role to play in transformative learning. Combined with reflection, it can influence students' beliefs, attitudes, and values, leading to personal transformation. Through these courses, I found that social movements and agroecological research are both intrinsically interdisciplinary and address sustainability topics, making them ideal for integration into immersion learning. They are key for integration into discourse led by systems thinking processes that target sustainability in food systems. Social movements topics bring attention to topics of power, equity and justice within food systems and link to the systems thinking iceberg model. This model makes meaning of stakeholder stories and actions, and their underlying values based on its values-practice-structure framework. Using embedded case studies focused on sustainability within this course format is an effective tool for systems-based analyses as students identify trends through their interactions with community actors who hold stake in the system. This way, learning becomes concentrated on major systems components, which are then related to more comprehensive food systems issues at broader scales. Other authors working in the fields of SAFSE and AE have found similar findings associated with case studies in food systems education (Lieblein, Francis et al., 2000; Francis, Breland et al., 2013; Hilimire, Gillon et al., 2014).

Reflective practice creates room for critical discourse on food systems and sustainability in addition to worldview exploration that considers roles, norms, values,

practice, and explores identities. Facilitated reflective practice by faculty experts offers opportunities for students to build and reflect upon their developing knowledge and skills, as well as make attitudinal and behavioral adjustments that match their personal transformations. For instance, the psychologically challenging stimuli of poverty in immersion-based food systems learning connects deeply to the affective domain of personal learning and development. As challenging and new ideas brush up against students' *habits of mind* and *points of view*, their perspectives and meaning-structures get repositioned and old mental frames make way for new ones (Mezirow, 2000; Moore, 2005). In addition to possible alignment toward pro-social behaviors, reflection combined with transformation further allows students to re-focus their programs of study or re-align their professional goals with their evolving frames.

Reflective practice within these settings requires a willingness by faculty instructors to shape conversation to address course concepts and connect them to broad social issues. Specifically, faculty-facilitated reflective practice that involves food justice topics is essential for immersion-based food systems education. Systems thinking and reflection join concepts of power and privilege, complexity and scale, and address students' assumptions and misconceptions in ways that lead to educational transformation. This creates an integrative learning environment that incorporates the knowledge and skills of faculty alongside the knowledge and skills of students and community partners in ways that merge a wide range of perspectives for enrichment of teaching and evaluation efforts. Food systems course topics are cemented together through reflective discussion, and increased opportunities for discussions around systemic structures foundational to social issues can be purposely woven into discourse to

address sustainability themes. Further, student reflection invokes more interest in changing or modifying personal attitudes and behaviors to better match increased awareness and understanding of broad food systems issues.

5.1.1. Sustainability Education and High Impact Educational Practices

This section outlines key categories of my research findings that are divided into the passive and active aspects of HIEP in relation to sustainability education framework principles. First, I describe characteristics of the passive and active aspects of immersion-based learning in food systems that connect SE to HIEP before offering insight into course development for immersion-based food systems formats for those who wish to teach similar courses. I further offer recommendations for the integration of SE with HIEP through participatory evaluation that is driven by AR in conjunction with UFE. Closing sections of this thesis address overarching study limitations and research implications.

The *passive* experiential agritourism format for these courses is based on study abroad (SA) and learning communities (LC). These HIEP link students to interdisciplinary systems thinking through inquiry-based learning associated with questioning and reflection on experiential activities. This inquiry leads students along the Perception Continuum of David Kolb's (1984) Experiential Learning Cycle between Concrete Experience and Abstract Conceptualization, enabling them to apply food systems theory to practice in authentic learning spaces. By connecting the three course frames of systems thinking, sustainability, and social movements to these concrete experiences, and in relation to food systems theory, faculty instructors guide inquiry in an

effort to achieve transformative learning goals. In addition to the relative ease and sensory pleasures associated with experiential agritourism within immersion-based food systems courses, these settings further engage students in practical and uninterrupted learning that connects to their personal and educational values. Regardless of their differing learning spaces (*nature* in residential learning communities and *farms* for immersion environments) and differing levels of education, from lower-division undergraduate residents to upper-division undergraduate and graduate students, students embrace the safe spaces of these learning environments. Similar to the findings of Gmelch (1997) students in these contexts engage in the psychosocial aspects that emerge from linking reflection to experience that lead to heightened understandings the self. Practical and uninterrupted learning formats offer ideal environments for facilitated reflection, providing space for students to discover new insights about themselves. When applied to impoverished agricultural regions of developing countries, immersion study abroad further offers opportunities to deeply touch the affective realm of the students' experience.

The second passive aspect of residential- and immersion-based learning in food systems is the LC structure itself. Unique course sequencing and structure for both undergraduate and graduate-levels of education introduce students to integrated concepts and dialogue associated with their linked courses and/or to research endeavors. This research reviewed two LC formats: 1) the embedded communities and required residential learning seminar contexts that bring students, faculty and staff together through core sustainability curricula for shared intellectual experiences, and 2) the intentional linking of lecture-based, immersion, and seminar courses in agroecology. In

both contexts, undergraduate students benefit from their involvement in a LC model that mixes their multiple disciplinary backgrounds and associated perspectives. Immersion courses that engage students from multiple disciplinary backgrounds further offer opportunities to integrate a greater diversity of epistemologies and perspectives, resulting in enriched discourse. Further, immersion food systems formats are ideal for the juxtaposition of students' and farming partners' worldviews that create dynamic learning environments, particularly when incorporated into reflective discourse facilitated by course instructors. Differentiated worldviews may be harder to address with the lower division students who seek a more homogenous group that provides comfort and inclusivity. However, there is also great opportunity within these settings to build trusting relationships essential for such critical dialogue and reflection to occur. In addition to proximity between peers, proximity between students and instructors enhances learning interactions and builds trust for open dialogue within these small class sizes. Reflective practice within these contexts requires faculty experts who guide students through discourse that draws upon a rich diversity of student, faculty, and community partner perspectives, engaging students in worldview development through values-clarification. Such processes of transformation are the most difficult outcomes to achieve in SE, yet immersion learning focused on HIEP offer ideal settings for their occurrence.

The *active* aspects of HIEP in immersion course design studied through this research include service-learning (SL) and undergraduate research (UR). There are multiple cognitive benefits and civic-related gains associated with reflection on meaningful, structured service-learning activities that addresses societal needs. Cognitive

benefits include: higher-order cognitive learning as well as the development of an empowerment variable that leads to active citizenship. Empowerment results from: a) perceived abilities to address complex social issues, b) awareness of justice issues, and c) identity development that is connected to a sense of place. Civic-related gains involve an orientation toward service and social justice, and cross-cultural gains. Further, SL is a good pedagogical match for addressing principles of inquiry- and problem-based learning because SL links to problem-solving pedagogies and civic-related outcomes. In both the residential and international immersion settings where SL was employed, it raised student awareness and understanding of issues, and helped students develop an action orientation toward environmental crises by engaging students in authentic and relevant learning. Similar to the findings of Jacoby & Associates (1996) and Brownell & Swayer (2009a), these educational and civic-related gains were achieved from the SL focus on meaningful, structured service activities that addressed real-world needs. My research with both learning environments also concurred with the findings of Kolb (1984), Jacoby and Associates (1996), Kuh (2008), and Brownell and Swayer (2009a), who emphasize the significant importance of faculty-led, facilitated, and analytical reflection for transforming these service experiences into learning and development.

The pedagogical format for the international immersion course in agroecology that engaged students in a collective undergraduate research (UR) project alongside their faculty instructor uniquely exposed them to experiential, interdisciplinary and participatory action research (PAR) processes. Through this pedagogical praxis, students learn about interdisciplinary and applied research methods and their contributions to higher learning and sustainable development initiatives. Such foundational experiences

in interdisciplinary research skills train students to become scientists who work in the field of sustainable agricultural development, building upon their systematic study of agroecology and developing key competencies for agroecosystem management and systems change. This format requires faculty expertise that combines interdisciplinary and participatory research methods with the field of agroecology. Through facilitated reflection by faculty, students socially construct meaning from these research experiences that evolve into new knowledge and skills in interdisciplinary fields. Other interdisciplinary fields working on far-reaching sustainability issues could benefit from a similar integration of UR and education to achieve deep levels of student engagement, learning, and development.

5.1.2. Course Development and Research Recommendations

This research suggests developing sustainability education through participatory course and program evaluation in order to study and further develop learning contexts. Participatory evaluative formats such as action research (AR) and utilization-focused evaluation (UFE) lead to reflective capacity, particularly when integrated as a way to serve as a recursive assessment tool for reflecting upon sustainability education in institutions of higher learning. As a leverage point and iterative tool, participatory evaluation allows program managers to measure the successes and failures of their innovations and mold them in such ways that strengthen the academic success goal of higher education. It further holds potential to address systemic institutional inertia and outdated research and teaching paradigms. Moreover, evaluative tools such as the Kellogg Foundation Logic Model (2004) hone development efforts and should be linked

to action-oriented research and education efforts to revitalize learning communities.

Participatory evaluation allows for a parallel level of organizational learning and transformation at the institutional level that occurs alongside course and program development. AR is a form of community-based problem solving at organizational and institutional levels. It creates space for professional development in sustainability education through cyclical and iterative processes that involve: a) problem recognition related to course, program, or institutional objectives, b) data collection and analyses in relation to identified problems, c) action planning to solve these problems, and d) ongoing participatory evaluation associated with these institutional actions. Through research iterations, spirals of inquiry are created that support development processes. These spirals are overlapping and have varying timeframes as they respond to the conditions in which they occur. Given the conservative nature of HEIs and barriers to assessment associated with funding, research and tenure, and accountability, AR offers a framework for working within and responding to these conditions in ways that result in institutional transformation, a necessary shift for responding to increasing complex sustainability challenges.

One way to expand this evaluative format more broadly in higher education involves linking sustainability education to HIEP in order to develop new and innovative models for a range of curricular, co-curricular, and residential formats within higher education. This research aligns with the ideas of AAC&U (2007) that suggest program assessment be linked to high-impact practices that engage students and elevate their academic performance. Thus, this research encourages further studies into the relationships between HIEP and engaged learning formats in sustainability education.

Based on these case studies, I encourage the systematic development of residential- and immersion-based learning in food systems and sustainability through this integration. Longitudinal tracking of data associated with institutional benchmarks, such as retention, return, and grade point averages, create clear pictures of program impact on student learning and development, or more comprehensive interpretations of university curricular focus on sustainability education. By using the iterative development model of AR, innovative models can be developed while professional development in SE takes place. An advantage of such processes is their ability to draw from multiple disciplinary backgrounds of course and program managers to address methodologies for teaching and learning about sustainability topics and concepts. They also engage student voice in ways that encourage student leadership within a learning community. By linking these processes with studies of sustainability in high-impact learning, educators can create a critical mass for sustainability education at colleges and universities while improving SE within their specific contexts. With rising support for sustainability educators in higher education, more research should be undertaken that links SE to HIEPs to develop innovations that respond to political shifts and tides.

Community-based problem solving structures of AR and UFE within the physical and social structures of residential- and immersion-based learning communities offer numerous opportunities to move SE in higher education institutions forward. From this research, I suggest that participatory evaluation address the following: a) creation of a campus hub for sustainability that involves developing campus research and education partnerships, b) integration of academic and student affairs programming tied to the residential learning community model so that intrinsic social justice issues of

sustainability are linked to program development, and c) development of a service learning reflection model (SLRM) to strengthen student learning and development within the varying LC models associated with this research. A SLRM links reflection on service to sustainability themes to achieve learning outcomes, and student portfolios provide a foundation for assessment as they link experience to learning via reflection. In these contexts, such a model would target leadership and active citizenship outcomes for transformative learning in SE. Further, they would respond to the need to assess the affective learning domain. Drawing from the EfS research conducted by Shephard (2006), assessment and evaluation outcomes related to environmental sustainability relate experiential learning to the affective domain so that students exhibit individual and emotional qualities that cause them to behave sustainably. In the field of food systems, incorporating a focus on the affective domain for learning is crucial for transformative learning that stems from understanding food systems issues. Given these relationships, I believe that participatory evaluation that links SE and HIEP should target affective learning outcomes as this domain is a key player in educational transformation.

5.2. Limits to Study

From these studies, I cannot tell the precise extent to which students were building specific knowledge and skills in the area of food systems. Nor, can I determine the extent to which pedagogical praxis principles of SE, such as systems thinking and reflection that help students develop problem-solving skills, impact student learning and development. This study further indicates that there is no given recipe for a perfect combination of HIEP in undergraduate education that will meet learning and

development outcomes in sustainability-related fields completely. This is one of the biggest limitations to my study. However, this research does shed light on the role of HIEP in immersion-based food systems education and in co-curricular residential learning focused on sustainability. By linking what I've learned about HIEP in these settings, we can use this knowledge to build course sequences and programs that intentionally engage students in multiple ways that build knowledge and skills associated with learning outcomes in the cognitive, affective, and behavioral domains.

Studies focused directly on measurements of learning and behavioral outcomes associated with specific sustainability education pedagogies would require indicators of student learning and development. Measuring affective outcomes may be one good indicator of transformative learning in food systems education. However, transformative learning is also difficult to measure, particularly within a residential or immersion timeframe. Qualitative measures can indicate that transformative learning is taking place, but metrics are needed to determine that extent to which specific transformation outcomes occur. Some measures for learning and development outcomes include tracking student participation in sustainability-related courses and programs, volunteer and internship opportunities, and employment choices that can further serve as indicators of their progress. Longitudinal studies that track students over time would be beneficial for determining professional and skills-related trends that stem from immersion and residential LC participation. These should be held in comparison to empirical measures of academic success. Combined with qualitative inquiry, quantitative metrics associated with learning and development outcomes provide a rich picture of the distinct impacts of course and program formats on student learning and development. Qualitative measures

obtained through student interviews and focus groups address relationships between these experiences in relation to other curricular, co-curricular, or post-graduate experiences and triangulate with the empirical and indicator-based data on learning outcomes. Educational designers should build these studies into course and program development as a way to track trends between residential and immersion programs and personal and professional food systems and sustainability experiences spanning the duration of their college careers and beyond. Through such research on HIEP and SE, greater opportunities emerge to provide holistic representations of student learning and development within these educational contexts.

5.3. Implications of the Research Findings

Although it is difficult to pinpoint the extent to which students learn and develop from these courses and programs, educators can include them within a wider scope of curricular programming focused on sustainability and food systems. By doing this, the challenges associated with short residential and immersion time-frames can be addressed, so that these course and program experiences become a piece of the educational portfolio that prepares students for post-college tenure when they enter diverse fields of work. For instance, the lower division residents who wish to come together around the concept of sustainability, rather than be challenged by it, can be offered introductory facilitated experiences that target worldview transformation. As transformative learning is an adult process, and these are largely first- and second-year students, it makes sense that these introductions be connected to upper division immersion and study abroad experiences that further their knowledge and skills in the integrative areas of sustainability and food

systems. Further, residential learning community programs could serve as hubs that synergistically connect students, faculty and staff through HIEP, contributing to a whole-systems campus cultural shift emphasizing real-world connections and community problem-solving. Such experiences would prepare students for HIEP experiences in their upper-division and graduate-level sustainability and food systems immersion courses.

Experiential immersion environments around the globe are ideally situated for agroecology education (AE) as a primary vehicle for sustainability education. This is particularly true for developing countries, as AE relates to Education for Sustainable Development in ways that encourage social, economic and environmental equity for all, recognizing food as a basic human right. Global learning environments that focus on sustainable international community development through SE in combination with HIEP would offer optimal formats for integrative learning about food systems and active citizenship. These contexts engage privileged students of higher learning in the U.S. and offer educational design opportunities for local populations through both formal and informal educational contexts. Given the global human population's shared need to consume food and the complex relationships that exist between humans and their food that can be viewed through cognitive, affective, behavioral, and cultural realms of humanity, shared knowledge of food systems components and issues should be addressed in meaningful ways through HIEP within global immersion-based food systems education. With these research-based ideas as starting points, AE at international levels of scale target not only student learning and development outcomes, but also broader goals of systemic change associated with the global food system. Although this is just one small-scale study of two distinct immersion courses, it offers a rich indication of

what is to come in the field of sustainable agriculture and agro-food systems in this increasingly uncertain anthropocentric age of climate change.

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Appendices

Appendix A: Milk to Maple Student Interview Guide

Appendix B: Milk to Maple Syllabus 2013

Appendix C: Café en Tacuba Syllabus 2011

Appendix D: Café en Tacuba Student Interview Guide

Appendix E: GreenHouse Guild Offerings

Appendix F: GreenHouse Year-End Questionnaire (AY2007-2009)

Appendix G: Request for GreenHouse student participation in summative evaluation

Appendixes H: GreenHouse Student Focus Group Questions

Appendix I: GreenHouse Student Interview Questions

APPENDIX A

Interview Guide for *Vermont's Rural Food System: From Milk to Maple 2013*

Interview Guide

- 1) Please describe your current work in food systems (at UVM/NYU) and/or work in the field of food systems external to the university.
- 2) What brought you to the Milk to Maple course? What did you hope to gain by taking this course?
- 3) After having completed the Milk to Maple course, how would you describe your overall reactions to this course?
 - a. What was most engaging about *Milk to Maple*?
 - b. What aspects of *Milk to Maple* most influenced your learning?
 - i. What do you know now that you didn't know before entering this course?
 - ii. Please describe any emotional responses you may have had to this course.
 - iii. Please describe any ways in which you have applied new knowledge or skills gained during the course.
 - c. What do you consider to be the most valuable aspects of this course?
 - d. Describe your reactions to the experiential nature of this course (as compared to other types of courses).
 - e. Describe your reactions to the reflective processes we utilized during this course (reflective writing and discussion at individual and group levels)
 - f. Describe your reactions to utilizing the three lenses of systems-thinking, sustainability and social movements to frame our inquiry and reflection throughout the course.
 - g. Describe your reactions to course assignments (systems and investigation papers, journal postings and reflective essays, and application papers).
 - h. In your opinion, do course assignments enhance your learning from this course?
- 4) If relevant to your experience at UVM/NYU, in what ways did your participation in *Milk to Maple* influence your overall experience in the MA in Food Systems program at UVM/ Food Studies program at NYU?
- 5) Is there any other feedback or final comments that you'd like to share?

APPENDIX B

Course Syllabus 395 Vermont's Rural Food System: From Milk to Maple

Credits: 3 credits

Instructors: Teresa Mares and Karen Nordstrom

Meeting dates and times: Monday, June 17th –Friday, July 12th 2013

Online Session: Monday, June 17th – Friday, June 21st

Wednesday, July 3rd - Friday, July 12th

Travel Immersion: Monday, June 24th -Tuesday, July 2nd

Location: UVM campus and locations throughout Northern and Central Vermont

Course Description:

In this course, students will be introduced to the complex interdependence of all aspects of the contemporary food system, with a focus on Vermont, a small rural agricultural state. The course adopts a systems analysis for understanding the history, present and future of Vermont's working landscape. The course will combine a broad exploration of important foods to the region from the past (maple syrup) and the present (diversified farms) with a more intensive case study of dairy farming, dairy products, and maple production. Our case study of dairy will include visiting a farmstead cheese maker, touring a large milk processing plant, visiting a dairy farm and holding maple and cheese tastings. Our broader exploration will include visiting a sugar shack, exploring value added maple products, visiting farms that rely on Community Supported Agriculture, a food venture center and more. This intensive trip to Vermont will include seminars with University of Vermont faculty, daily student led discussions, interactions with producers and field trips.

Goals:

- To introduce students to working landscape in Vermont.
- To introduce students to a rural agricultural state whose products regularly enter an urban metropolitan area.
- To engage students in systems thinking as they experience the challenges and opportunities of Vermont's food system.
- To engage students in thinking about concepts of sustainability as they experience the challenges and opportunities of Vermont's food system.
- To allow students to thoughtfully reflect on their experience in Vermont as it pertains to food systems and sustainability.

At the End of the Course, Students Should be able to:

- Reflect upon Vermont's working landscape through offering a personalized analysis of the state's food and farming systems.
- Utilize systems thinking and the concept of sustainability both to reflect on their experience and to analyze current food systems issues in Vermont.
- Apply their understanding of the various meanings of sustainability to urban and rural food environments.

APPENDIX B

General Course Information:

- **We expect professional standards of behavior.** This is a quick and intensive course. All students should come to Vermont prepared to attend all planned activities at the times indicated on the schedule below. During discussions or field trips cell phones and pagers should be on vibrate or turned off. Everyone will be traveling together in one van so everyone needs to be ready each morning by the scheduled departure time.
- **We expect participation from every student.** This promises to be a completely participatory learning experience. Seize the day. Contribute to discussions. Ask lots of questions.
- **All readings must be read completely and all reflections must be completed.** We see this as a course that relies on dialogue that emerges from your engagement with your experience.
- **We do not accept late assignments.** If you hand in an assignment late, you will be marked down a five points for every day the assignment is overdue.
- **All assignments need to satisfy the standards of academic integrity.** Plagiarism (not attributing other people's ideas, arguments or phrases properly) and cheating will result in a failing grade.

Required and Recommended Readings:

With the exception of Albers, all readings available on Blackboard

Required prior to travel immersion:

- Albers, J. (2000). *Hands On The Land: A History Of The Vermont Landscape*. Cambridge, MA: The MIT Press. Chapters 3-5 Required Chapters 1-2 Recommended
- Meadows, D.H. (2008). *Thinking in Systems: A Primer*. White River Junction, VT: Chelsea Green Publishing. Introduction and Chapter 1 Required
- Meadows, D.H. (1999) *Leverage Points: Places to Intervene in a System*. Hartland, VT: The Sustainability Institute.
- Kloppenburg Jr., J., Lezberg, S., De Master, K., Stevenson, G. W., & Hendrickson, J. (2000). Tasting Food, Tasting Sustainability: Defining the Attributes of an Alternative Food System with Competent, Ordinary People. *Human Organization*, 59(2), 177-186.
- Heller, M. C., & Keoleian, G. A. (2003). Assessing the sustainability of the US food system: a life cycle perspective. *Agricultural Systems*, 76, 1007-1041.
- Pimbert, M. P., Thompson, J., Vorley, W. T., Fox, T., Kanji, N., & Tacoli, C. (2001). *Global Restructuring, Agri-Food Systems and Livelihoods* (Vol. Gatekeep Series no. 100). London: International Institute for Environment and Development: Sustainable Agriculture and Rural Livelihoods Program.
- Vermont Sustainable Jobs Fund. (January 2011). *Farm To Plate Strategic Plan: Executive Summary*. Burlington.
- Paxson, H. (2013). *The Life of Cheese: Crafting Food and Value in America*. Berkeley, CA: University of California Press. Chapters 1, 2, and 7 Required.

APPENDIX B

- Mares, T. & Alkon, A. (2011). Mapping the Food Movement: Addressing Inequality and Neoliberalism. *Environment and Society*, 2, 68-86.
- Allen, P. & Sachs, C. (1991) The Social Side of Sustainability. *Science as Culture*, 2(4), 569-590. London: Free Association Books.
- Parsons, B. (ND). *Vermont Dairy Sector: What is the Future of the 800lb Gorilla?* White paper, University of Vermont. Burlington, VT.

Readings that will bring depth to experiences:

- Trubek, A. B. (2008). *The Taste of Place: A Cultural Journey Into Terroir*. Berkeley and Los Angeles: University of California Press. Introduction and Chapter 6.
- Ayres, J. & Bosia, M. (2011). Beyond Global Summitry: Food Sovereignty as Localized Resistance to Globalization. *Globalizations*, 8(1): 47-63.
- Wirzba, N. (ed). (2004). *The Essential Agrarian Reader*. Selected Chapters. Washington, DC: Shoemaker and Hoard.
- Hewitt, B. (2011). *The Town That Food Saved: How One Community Found Vitality In Local Food*. Selected Chapters. New York: Rodale Press.
- Lovell, S. T., DeSantis, S. r., Nathan, C. A., Olson, M. B., Mendez, V. E., Kominami, H. C., et al. (2010). Integrating Agroecology and Landscape Multifunctionality in Vermont: An evolving framework to evaluate the design of agroecosystems. *Agricultural Systems*, 103(2010), 327-341.
- Food Chain Workers Alliance. (2012). *The Hands that Feed Us: Challenges and Opportunities for Workers Along the Food Chain*. Los Angeles, CA: Food Chain Workers Alliance.

Student Evaluation/Assessment and Course Assignments:

Systems Paper: Students will write a 2-3 page paper that applies a systems analysis to food and farming in Vermont, developing a preliminary definition of Vermont's food system. This initial paper is due and will be discussed the first day of the travel immersion. *Students should prepare this paper after completing the readings prior to the travel immersion and bring a hard copy of this paper to the first day of class.*

Investigation Paper: Students will divide into small groups to identify and explore a question pertaining to the Vermont food system. Based on this exploration, each student will write a 2-3 page paper that outlines the question that guides the inquiry, the process used to explore answers to the question, and what was learned about this topic through these processes.

Individual Journal Responses: Individuals will write 5 journal responses of 400-500 words on the following visits. *Journals should all be uploaded to Blackboard by the end of the day on Tuesday, July 2nd.*

Burlington
Northeast Kingdom
Montpelier
Addison County
Northwest Vermont

APPENDIX B

Reflective Essay: Students will write a 5-page reflective essay that integrates experiences in Vermont with an analysis of the food system. *Essays should be uploaded to Blackboard by the end of the day on Monday, July 8th.*

Application Paper: Students will write a 8-page paper that allows them to apply the theoretical frameworks and concepts from the course to an ongoing or proposed research project or relevant scenario. In this paper, students should utilize at least 7-10 sources connected to their thematic focus (these can be drawn in part from recommended readings above). *Application papers should be uploaded to Blackboard by the end of the day on Monday, July 15th.*

Throughout the paper, students will develop and apply a critical analysis that utilizes the following frameworks:

- Sustainability
- Systems thinking
- Social movements

For instance, a graduate student may decide to write their paper on how these themes connect with their ongoing or proposed thesis, whereas someone engaged in an internship project might write their paper on developing a program and event for a community-based organization.

Percentage Contribution of Each Assignment:

Systems Paper: 10%

Investigation Paper: 10%

Participation in Discussions (of all sorts; online and face-to-face): 20%

Individual Journal Responses on Site Visits and Investigation: 10%

Reflective Essay: 20%

Application Paper: 30%

Tentative Travel Immersion Schedule:

Monday June 24th (Burlington and Winooski)

Class will meet at 9am in Marsh Life Science Room 357 (NFS Conference Room)

New Farms for New Americans Tour, Burlington

Visit with Vermont Works for Women FRESH Food Program, Winooski and Lunch

Systems Thinking Discussion on Campus

Dinner Together, Location TBA

Tuesday June 25th (Montpelier)

Class will meet at 8:30am in Marsh Life Science Conference Room (Rm. 122)

Bob Parson's Talk: Implications of Dairy Policy on Vermont Dairy Farms

Vermont Sustainable Jobs Fund

New England Culinary Institute and Vermont Fresh Network

Lunch

Vermont Agency of Agriculture Food and Markets

APPENDIX B

Hunger Mountain Cooperative
Dinner on own (Back to Burlington around 6pm)

Wednesday June 26th (Northeast Kingdom)

Overnight Stay at Lakeview Inn
Class will meet at 8:30 am on campus, specific location to be announced.
High Fields Center for Composting
Picnic Lunch
Jasper Hill Farm
Couture's Maple Shop
Dinner at Claire's

Thursday June 27th (Northeast Kingdom)

Center for an Agricultural Economy and Food Venture Center
Hill Farmstead Brewery
Picnic Lunch
UVM Food Systems Conference
Dinner on Own

Friday June 28th (Addison County)

Class will meet at 8:30am on campus, specific location to be announced
Intervale
Shelburne Farms
Twig Farm
Cabot Creamery
Fiddlehead Brewery
Dinner at Folino's Pizza

Saturday June 29th (Burlington)

Class will meet at 9:30am at Location TBD, Downtown Burlington
Optional Trip Farmers' Market
Afternoon: off – work on investigations, reflections, etc.

Sunday June 30th

Off – work on investigations, reflections, etc.

Monday July 1st (Northwest Vermont)

Class will meet at 9:00am on campus, specific location to be announced
St. Albans Cooperative Creamery
Green Winds Farm
Lunch
The Farm Between
Boyden Valley Farm
Dinner on Own, Back to Burlington around 6-6:30pm

Tuesday July 2nd (Wrap up)

Class will meet at 9am in Marsh Life Science Room 357 (NFS Conference Room)
Closing Thoughts and Maple Tasting
Wrap up around noon

APPENDIX C

Café (en) Tacuba: Ecologies and Livelihoods in a Shade Coffee Landscape of El Salvador (PSS/ENVS 295)

January 3 to 14, 2011

Instructors:

V. Ernesto Méndez, Ph.D., Assistant Professor,
Environmental Program & Department of Plant & Soil Science, UVM

Karen Nordstrom, M.A.E

Greenhouse Living and Learning Communities & Rubenstein School of Environment and Natural Resources, UVM

Teaching Assistant:

Marcello Godcharles, B.A.

Fundación Salvadoreña para la Salud y el Desarrollo Social (FUSAL)

COURSE OVERVIEW

As a follow-up of the content presented in Coffee Ecologies and Livelihoods (PSS 003) in the fall, we transport ourselves to the coffee landscape of Tacuba, El Salvador. Here we learn how coffee is produced by different types of growers, help the Association of Organic Coffee Producers of Western El Salvador (ACOES) harvest their red, ripe beans, and engage in field agroecological and social research related to conservation and rural livelihoods. We finalize our journey with a Spring course at UVM that focuses on reflecting on the field experience, re-entry to the home culture, and exploring future actions related to course content and experience. This 7-credit sequence is designed to expose students to the complexity of global coffee networks, the actors that play a role in them, and the challenges and opportunities facing more ecologically sound and socially just coffee production and consumption. It emphasizes experiential learning and critical reflection by students on social and ecological issues related to local and global sustainability.

COURSE EXPECTATIONS

We expect professional standards of behavior. This is a quick and intensive course. All students should travel to El Salvador prepared to attend all planned activities. We will be traveling together, so everyone needs to be ready each morning at the designated time (to be determined in country). Given these factors, we expect students to engage in responsible behavior that facilitates experiential learning. Early morning preparation, as well as early departure times, requires students to be sufficiently rested (i.e. get a good night's sleep).

Students are expected to avoid risks, follow national and local laws and cultural norms, and abstain from alcohol consumption. These issues were covered in detail in pre-departure meetings.

We expect active participation from every student. Active participation involves both sharing and listening during discussions, as well as active engagement in writing, team building, service and cultural experiences.

All readings must be read completely and all reflections must be completed. We see this as a course that relies on dialogue that emerges from your engagement with your experience.

APPENDIX C

We do not accept late assignments. If you hand in an assignment late, you will be marked down five points for each day the assignment is overdue. All assignments need to satisfy the standards of academic integrity. For example, *plagiarism* (not attributing other people's ideas, arguments or phrases properly) is unacceptable.

BACKGROUND READING

These readings will support course content, cultural context and field exercises.

- Bacon, C., Méndez, V. E., & Brown, M. (2005). *Participatory action-research and support for community development and conservation: examples from shade coffee landscapes of El Salvador and Nicaragua*. Research Brief # 6. Center for Agroecology and Sustainable Food Systems (CASFS), University of California: Santa Cruz, CA, U.S.A.
http://repositories.cdlib.org/casfs/rb/brief_no6/
- Cuéllar, N., I. Gomez, S. Kandel & H. Rosa (2002) *Rural poverty and the environment in El Salvador: lessons for sustainable livelihoods*. PRISMA: San Salvador, El Salvador (Executive Summary).
- Iyer, P. (2008) *Why we travel*. <http://www.goliards.net/Why%20We%20Travel.htm>
- Méndez, V. E. (2008) *Farmers' livelihoods and biodiversity conservation in a coffee landscape of El Salvador*. pp. 207-236. In C. Bacon, V. E. Méndez, S. R. Gliessman, D. Goodman & J. A. Fox (eds.) *Confronting the coffee crisis: Fair Trade, sustainable livelihoods and ecosystems in Mexico and Central America*. Cambridge, MA, U.S.A.

ASSIGNMENTS

1. Pre-Departure Journal Assignments on Blackboard:

These entries will be discussed during pre-departure meetings.

- a. Journal Assignment #1: "Cafe en Tacuba Study Abroad."

In your entry, describe any expectations and fears associated with your upcoming Cafe en Tacuba experience.

- What personal interests have led you to participate in this course?
- What values do you bring to this course (i.e. why is this important to you)?
- What challenges or personal struggles do you anticipate encountering throughout the experience?

- b. Why We Travel by Pico Iyer

Create a journal entry titled "Why We Travel."

Respond to the following prompts:

- Choose and copy a passage or sentence from this article that particularly resonated with you.
- Do you agree or disagree with what Iyer is saying? Why?
- What does travel mean to you? How do you think any aspect of this article applies to your trip?

APPENDIX C

2. Pre-Departure Discussion Board Posts

- a. Introductions- Introduce yourself (name, major & where you are from) and include a description of any prior experience that may be relevant to cross-cultural exchange. This may include study abroad, travel, academic coursework, service-learning, jobs, memberships, history with family/friends, etc.
- b. From Journal Entry #1, share an expectation and/or fear that you have for this upcoming study abroad course. Then, post a reply to a classmate: Discuss a key point or observation they made that you wish to emphasize or expand upon.
- c. From Journal Entry #2, select one of your responses and share it with the group.

3. In-Country Written Journal Reflections on Blackboard

- a. Students will complete 10 personal reflections of 1-2 pages, based on daily course activities in El Salvador.
- b. The 10 required journal entries should be at least 1-2 pages in length and will not be graded, but will be counted (10 points) toward your final grade. Please include the day/date/time/place of each entry at the top of the page.

4. Reflective Essay

- a. Keeping a journal during the experiential component of this course will enable you to use language that serves to help you learn for yourself. The journal entries will then be translated into a reflective essay, to be written using language to communicate your ideas to others. The use of reflective practice in this course will be the means by which you will provide your instructors with concrete, tangible evidence of your learning.
- b. Students will write a 5-page reflective essay that integrates experiences in El Salvador with an analysis of other coffee actors and networks (e.g. roasters, importers, consumers).

APPENDIX C

5. Ecology and Livelihoods Field Report

We will be collecting field data to help us understand and characterize the coffee landscapes and farmers of Tacuba and Ataco. Each student will keep careful notes of our field exercises in their field journal (notebook). These will be used to draft a final field report (6-8 pages, double spaced). The field report will integrate the methodologies of direct and participant observation, tree biodiversity and coffee density plot measurements, focus groups and farmer interviews. Field reports should include the following sections:

- a. *Introduction*. Brief description of where and what you were doing. (7.5)
- b. *Description of the Ataco and Tacuba landscape*. Use your observations, and secondary information to provide a description of the social and ecological characteristics of Ataco and Tacuba.(7.5)
- c. *Characterization of the livelihoods of ACOES and its member families*. A description of the social, economic and cultural characteristics of the ACOES farmers.(12.5)
- d. *Agroecological characterization and management of the shade coffee plantations*. We will be setting up plots to document tree species richness and abundance, coffee density, and elevation. In addition, students will ask farmers specific management questions related to coffee farming. A separate guide will be provided for this purpose. This information can also be integrated with the on-farm activities that the farmers will be leading. (12.5)
- e. *Environmental Conservation Potential and Challenges*. Based on your data discuss the potential role, opportunities and challenges for the ACOES coffee plantations to contribute to conservation efforts.(10)

Student Evaluation/Assessment

<i>Assignment</i>	<i>Points</i>	<i>Due Date</i>
1. Participation in Course Activities, including discussions, field activities, and journaling.	10	
2. Written journal reflections	10	January 20
3. Reflective Essay	50	February 1
4. Field Report	50	March 4
Total	120	

APPENDIX C

Schedule for Café en Tacuba 2011

Mon Jan 3	Tue Jan 4	Wed Jan 5	Thu Jan 6	Fri Jan 7	Sat Jan 8	Sun Jan 9
Arrival Tipico dinner San Salvador	In-country Intro	Anthro Museum Reflection	Reflection Canopy tour	Planning Reflection Tacuba all day - introductions	Reflection Tacuba data collection	Reflection Tacuba data collection
Hotel Mediterraneo	Botanical garden San Salvador Hotel Mediterraneo	To Ataco Apaneca town Hotel Jardin Celeste	Ataco town Coffee cupping at Finca El Carmen Hotel Jardin Celeste	- hikes Hotel Jardin Celeste & ASINDEC	Field exercise Hotel Jardin Celeste & ASINDEC	Field exercise Hotel Jardin Celeste & ASINDEC
Mon Jan 10	Tue Jan 11	Wed Jan 12	Thu Jan 13	Fri Jan 14	Sat Jan 15	Sun Jan 16
Reflection Tacuba data collection	Reflection Hike El Imposible	Coatepeque lake	Free morning	Back to VT		
To El Imposible Hostal El Imposible	Return to Ataco Hotel Jardin Celeste	Return to SS?? Hotel Mediterraneo	Prep Final reflections Hotel Mediterraneo			

Telephone Contact Information

Ernesto's cellular phone: 011-503-7240-3996

Hotel Mediterraneo, San Salvador: 011-503-2263-4640

Hotel Jardin de Celeste, Ataco: 011-503-2433-0277

ASINDEC office in Tacuba: 011-503-2417-4677

Hostal El Imposible: 011-503-4411-5484

APPENDIX D

Focus Group Interview Guide Café en Tacuba WI09

Focus Group Agenda

Updates from Ernesto

- 1) Fundraising for ACOES
- 2) Coffee production, markets, and PAR updates

Questions recorded on white board—

- 1) What was most engaging to you during Café en Tacuba?
- 2) What most influenced your learning during Café en Tacuba?

Asked verbally—

- 3) Characteristics unique to this course are its experiential focus and immersion nature, meaning you are purposefully engaged in hands-on, applied learning.
 - a. Did these aspects of the course influence your acquisition of knowledge and/or skills,
 - b. Did these aspects of the course influence you emotionally? (eg. Poverty)

APPENDIX E

GreenHouse Guild Offerings

Conscious Consumers
Exploring Place
Yoga and Environmental Stewardship
Sustainable Food Systems
Environmental Arts & Crafts
Traditional Skills
Mushroom and Spore Hunters
Bike Users Group
Baking
Knitting
Compost

APPENDIX F

Spring 2008 GreenHouse Residential Learning Community EVALUATION

In an effort to assess and improve the GreenHouse RLC and this year's programs, we are asking that *all residents of the GreenHouse* take time to fill out the following evaluation. This is an opportunity to make a difference in the GreenHouse community. Take advantage of it! *Your responses will be made available to GreenHouse staff but will be kept anonymous, so please be honest.* If you have questions or comments regarding this evaluation please contact Christina Erickson (christina.erickson@uvm.edu) or Steve Libby (steve.libby@uvm.edu) in the GreenHouse Office (UHS, Room 9). The survey should take approximately 20 minutes to complete.

When you have submitted the survey, you will be taken to a page where you can enter a random drawing to win one of three \$50 gift certificates to City Market!

Thank you for your time!

Demographic Information Questions: #1 - 6 (Optional)

The following six demographic questions will be used for overall statistical data only and are optional.

- 1) What is your current academic rank?
 - ☐ first year student
 - ☐ sophomore
 - ☐ junior
 - ☐ senior
- 2) How many years, including this year, have you been a student at UVM?
 - ☐ 1 year
 - ☐ 2 years
 - ☐ 3 years
 - ☐ 4 years
 - ☐ 5 years or more
- 3) How many years, including this year, have you lived in the GreenHouse?
 - ☐ 1 year
 - ☐ 2 years
- 4) I wish to identify myself as:

APPENDIX F

- ☐ African American/Black
- ☐ American Latino/Alaska Native
- ☐ Asian American/Pacific Islander
- ☐ Caucasian/White
- ☐ Latino/Hispanic
- ☐ Multiracial
- ☐ Other: Please specify: _____

4) I identify my gender as:

- ☐ Female
- ☐ Male
- ☐ Transgender

5) My academic major:

6) I live in

- ☐ S1
- ☐ S2
- ☐ S3

The following questions are related to your general experience in the GreenHouse RLC.

7) What was your level of involvement in the GreenHouse this year (check all that apply)

For a description of these programs, see <http://www.uvm.edu/greenhouse> (Copy and paste link in a new browser window in order to preserve the data you have entered thus far).

- ☐ Green Lifestyle
- ☐ Ecology of Place
- ☐ Ecological Citizenship

8) If you were involved in the courses (Ecology of Place or Ecological Citizenship), please rate your overall satisfaction with those courses.

- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Not Very Satisfied
- ☐ Not At All Satisfied

9) Please rate your overall satisfaction with the GreenHouse this year.

- ☐ Very Satisfied

APPENDIX F

- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Not Very Satisfied
- ☐ Not At All Satisfied

10) What do you like the most about the GreenHouse?

11) What can be done to improve the GreenHouse?

(Consider these questions: What can the GreenHouse staff do? What can you do? What can your fellow community members do?)

12) Up to this point, the GreenHouse is meeting its goals.

Please refer to the description of the GreenHouse at <http://www.uvm.edu/greenhouse> (Copy and paste link in a new browser window in order to preserve the data you have entered thus far).

- ☐ Strongly Agree
- ☐ Agree
- ☐ No Opinion
- ☐ Disagree
- ☐ Strongly Disagree

13) About how many hours per week (average) do you spend on GreenHouse-related activities? (please do NOT include hours towards courses for credit)

14) Please describe your satisfaction with the level of activity in the GreenHouse.

- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Not Very Satisfied
- ☐ Not At All Satisfied

APPENDIX F

15) What types of GreenHouse-related activities have you participated in?

Check all that apply.

- ☐ Course(s) for credit
- ☐ GreenHouse Guild(s)
- ☐ Field trips
- ☐ Workshops
- ☐ Presentations/Lectures
- ☐ Guest speakers
- ☐ Movies/films
- ☐ Outdoor recreational activities
- ☐ Community meetings
- ☐ Social events
- ☐ Community Service/Volunteer activities
- ☐ Informal conversations/meetings with a faculty member
- ☐ Conversations of an academic nature with peers outside the classroom
- ☐ Participation in events sponsored by/with another RLC or L/L program
- ☐ Fleming Museum Exhibit/Event
- ☐ Other: _____
- ☐ Other 2: _____

16) Please rate your level of satisfaction with the types of activities (as mentioned in the question above) occurring in the GreenHouse?

- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Not Very Satisfied
- ☐ Not At All Satisfied

17) What additional activities would you like to participate in with the GreenHouse? *Check all that apply.*

- ☐ Course(s) for credit
- ☐ GreenHouse Guild(s)
- ☐ Field trips
- ☐ Workshops
- ☐ Presentations/Lectures
- ☐ Guest speakers
- ☐ Movies/films
- ☐ Outdoor recreational activities
- ☐ Community meetings
- ☐ Social events
- ☐ Community Service/Volunteer activities
- ☐ Informal conversations/meetings with a faculty member
- ☐ Conversations of an academic nature with peers outside the classroom

APPENDIX F

☐ Participation in events sponsored by/with another RLC or L/L program

☐ Fleming Museum Exhibit/Event

☐ Other: _____

☐ Other 2: _____

18) How many hours per week (average) are you seriously (and regularly) willing to commit to GreenHouse activities?

19) What did you hope to gain upon entering the GreenHouse?

20) As the year concludes, what do you believe you have gained by being a member of the GreenHouse?

21) My membership in the GreenHouse has had the following effect on my academic performance:

- ☐ Negative
- ☐ Somewhat Negative
- ☐ No Affect
- ☐ Somewhat Positive
- ☐ Positive

22) If your membership in the GreenHouse has had any effect on your academic performance, please explain how.

APPENDIX F

23) If returning to the GreenHouse next fall, list any GreenHouse related hopes and goals you have for the upcoming semester.

The following questions are related to your experience with the GreenHouse staff.

24) I feel comfortable approaching the GreenHouse staff.

- ☐ Strongly Agree
- ☐ Agree
- ☐ No Opinion
- ☐ Disagree
- ☐ Strongly Disagree

25) The GreenHouse staff is responsive to my comments, concerns, and suggestions.

- ☐ Strongly Agree
- ☐ Agree
- ☐ No Opinion
- ☐ Disagree
- ☐ Strongly Disagree

26) In what other ways could the GreenHouse staff meet your needs?

Additional Questions about your GreenHouse experience

27) How did you find out about the GreenHouse? *Check all that apply.*

- ☐ Admissions tour
- ☐ Admitted Student Visit Day
- ☐ Family
- ☐ Friends

APPENDIX F

- ☐ June Orientation
- ☐ GreenHouse staff
- ☐ GreenHouse website
- ☐ Residential Life mailings
- ☐ Residential Life staff
- ☐ Residential Learning Communities Website
- ☐ Other: _____

28) What influenced you in your decision to select the GreenHouse?

Check all that apply.

- ☐ Activities in GreenHouse
- ☐ Building tours
- ☐ Connection with GreenHouse staff
- ☐ Connection with GreenHouse affiliated professors/faculty members
- ☐ Friends living in the GreenHouse
- ☐ Location of GreenHouse on UVM campus
- ☐ Recommendation of former GreenHouse resident(s)
- ☐ Suite-style living accommodations in GreenHouse
- ☐ Other: _____

29) Please rate your level of satisfaction with the physical environment of the GreenHouse.

- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Not Very Satisfied
- ☐ Not At All Satisfied

30) What suggestions would you make to improve the physical environment of the GreenHouse?

31) What ideas do you have for enriching the intellectual environment at the GreenHouse?

APPENDIX F

32) Please rate your satisfaction with the social environment and sense of community at the GreenHouse?

- ☐ Very Satisfied
- ☐ Somewhat Satisfied
- ☐ Neutral
- ☐ Not Very Satisfied
- ☐ Not At All Satisfied

33) What suggestions do you have for enhancing the sense of community within the GreenHouse as a whole?

34) What ideas do you have for additional activities or improvements to current GreenHouse activities? Please include speakers, workshops, field trips, etc. that you would like to see included in future programming plans.

35) How do you find out about events that are going on in the GreenHouse and around campus? *Check all that apply.*

- ☐ "GreenHouse Grapevine" weekly e-mail newsletter
- ☐ Posters on walls/bulletin boards
- ☐ UHS Flatscreen
- ☐ GreenHouse Web Calendar
- ☐ Word of mouth from friends
- ☐ From GreenHouse staff
- ☐ From my RA
- ☐ Other: _____

36) What are the three most effective ways (from the list above) for us to let you know about events that are going on in the GreenHouse and around campus?

Most Effective Way _____
Second Most Effective Way _____
Third Most Effective Way _____

APPENDIX F

37) Based on your experience so far, would you choose to live in the GreenHouse again?

- ☐ Yes
☐ No

38) Why or why not?

39) What types of GreenHouse Guilds would you like to see developed that do not already exist?

40) Please include any additional comments or suggestions for the GreenHouse staff here:

41) Please indicate whether or not you feel that your participation in the GreenHouse Residential Learning Community has helped you to:

	Stron gly Agree	Agree	No Opini on	Disag ree	Stron gly Disag ree
Better under stand yours elf	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX F

and your abilities, interests and personality.					
Improve your ability to get along with different kinds of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Function as part of a team.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improve your ability to put ideas together, to see relationships, similarities and differences between	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX F

ideas.					
Learn more about environmental issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make connections between the environment and personal living choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Take advantage of opportunities to serve the community.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Build a strong sense of community within the GreenHou	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX F

se.					
Attend events and activities that you might not otherwise have attended.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improve your ability to learn on your own, pursue ideas, and find information you need.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Try new things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understand/look at social issues from	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX F

a variet y of persp ective s.					
Interact more with facult y and staff outsid e of the classr oom or office.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Devel op better time mana geme nt skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enha nce your oral comm unicat ion skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enha nce your writte n comm unicat ion skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enha	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX F

nce your probl em- solvin g skills.					
Devel op your leade rship skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

42) Do you have any comments about this survey?

APPENDIX G

Dear Former GreenHouse RLC Residents,

GreenHouse is currently undertaking a participatory effort to evaluate our progress, now that we are coming to a close of our third year of programming. We would love to hear about *your* experience with GreenHouse—from your prior level of involvement and level of satisfaction with the program, to your identification with the program in developing your sense of place within the UVM community.

Your feedback will greatly help us as we design structures that help build positive experiences for incoming and future GreenHouse residents.

We will be holding multiple GreenHouse Focus Groups this month - on April 14, 15, 16 and 19. Each focus group will be scheduled for an hour-and-a-half, although they may not last for more than an hour. The focus group will be facilitated by Karen Nordstrom (GreenHouse Program Specialist and RSENr Graduate Student), with GreenHouse RLC staff support (from Living/Learning Director John Sama, Faculty Director Walter Poleman, Associate Director Steve Libby, Program Specialist Katherine Kransteuber, and/or Faculty-in-Residence Terry Delaney).

PIZZA WILL BE PROVIDED!

(Please respond to this email if you have any dietary restrictions.)

We are asking each of you to attend ONE focus group.

HERE'S HOW YOU SIGN UP:

We have created an on-line process which will enable you to let us know which groups you are able to attend. Please follow the hyperlink below and select **ALL** of the dates/times that work for you. We will review all submissions and notify you by April 13th which group you have been assigned to.

Here's the link to the on-line sign-up:

<http://doodle.com/4muiiywt39npggk6>

PLEASE RESPOND BY FRIDAY, APRIL 15th!

Thank you!

APPENDIX H

GreenHouse Focus Group Questions Student Participants from AY 07-08 (carryover into 09) Spring 2009

AS PARTICIPANTS ARRIVE

- **Give them the quick demographic survey handout to complete.**
 - Name, Year, Major, S1/S2, Nested Communities, Guilds

WELCOME & INTRODUCTIONS

- Quick introductions of participants.
 - Facilitator: Ask questions, prompt when necessary, keep the conversation going.
 - Note Taker: A silent observer who will be taking notes about the conversation.
Generally will not be participating in the discussion.
- Why we've asked you to be part of this group.
- We have prepared a few questions that we hope will prompt some interesting discussion among the group. These questions will ask you about your experiences with the community, focusing on your engagement and perceptions around the "sense of community" that exists(ed) while you are (were) a resident. If there is additional time, we will address questions concerning your original interest in GreenHouse, your level of satisfaction with your GH experience, and your thoughts about programming and what you've learned in GH.
- The purpose of the focus group is for us to hear from you. If questions come up as we're going through this, write them down and raise them with us at the end.
- **Review Ground Rules**
 - We want everyone to participate.
 - There is no "right" or "wrong" answer.
 - One person speaks at a time.
 - Don't dominate the conversation. If you've already responded to a question, please allow time for others to participate before you respond to another question.
 - Please be respectful. Everyone's experience is unique.

APPENDIX H

SENSE OF COMMUNITY

An important objective of any RLC is the development of a sense of community. It is our hope that students “identify” with or feel like they “belong” to their community.

- **How would you describe the sense of community within GreenHouse?**
 - **What types of things get in the way of building a sense of community?**
 - **What things help to enhance a sense of community?**
- **Question about space**
 - **What spaces in GreenHouse engage or facilitate a sense of community?**
 - **What changes could we make to the physical appearance of the GH that would make it more evident that you are in the GH?**
- Can you talk about interactions that you’ve had with GreenHouse faculty and staff?

STUDENT ENGAGEMENT

The GreenHouse isn’t just a community, it is a LEARNING community. This is a co-curricular program, intended to complement your educational experience.

- **Can you talk about one GH event that you attended and why it was meaningful to you?**
- **We recognize that student-initiated and –run programming increases student participation and engagement? How can we best prepare and support students to take this on?**
- **What is the potential for GH to complement your academic program?**
- What do you know now that you didn’t know before?

ABOUT YOUR INTEREST IN GREENHOUSE

- **What was it that you were hoping to gain by being part of GreenHouse?**
 - **Can you talk about why you applied to be part of GreenHouse?**
- How did you find out about the GreenHouse?
In what ways did the possibility of being in GreenHouse influence your decision to attend UVM?

SATISFACTION WITH EXPERIENCE

- **In what ways has (had) living in GreenHouse been significant to you?**

APPENDIX H

- **Have your experiences in GreenHouse influenced your decision to remain at UVM? If so, in what ways?**

FUTURE OF GREENHOUSE

- **In your opinion, what do you think the role of the GH should be?**
- **Any other feedback or comments that you'd like to share?**

IF THERE IS ADDITIONAL TIME:

LEARNING

How have our efforts to present programming been received?

- **Targeted learning outcomes that we have identified for GH include:**
 - **Ecological literacy—environmental stewardship**
 - **Understanding Place—community building**
 - **Holism—systems thinking and interdisciplinary problem-solving**
- **Are there other things that you have gained through your participation in GH?**

CLOSING

- **If these questions or our conversation this evening have raised concerns that you would like to talk about privately with a GreenHouse staff member, please let us know.**

APPENDIX I

Interview Guide for previous GH students:

- 1) When were you a GH resident? What was your academic year when you were a resident? How did you find out about GH?
 - i. If first year, how did GH influence your transition to college?
 - ii. If returner, how this program compares with other residential settings on campus?
 - iii. How long did you live in GH? Where did you go after GH?
 - iv. What was the overall influence GH had on your housing experience while at UVM?
- 2) What is your major? Had you declared your major before entering GH? Did your major influence your decision to choose GH or vice versa?
- 3) Have you played any other roles in the GHRLC community? (mentorship, design group, guild leader, etc.)
- 4) In relation to your academic career at UVM,
 - a. Did GH play a role in your academic development at UVM? If so, How?
 - b. What kinds of environmental topics were you exposed to as a result of living in GH? In what way(s) did you engage in this content? What have you learned from this engagement?
- 5) How would you describe your involvement as a GreenHouse student?
 - a. Were you involved in GH activities, such as Ecology of Place, Eco-Citizenship, Guilds, Community Gatherings, etc.?
 - i. Please describe these events/activities and how they played a role in your overall GH and college experiences.
 - ii. Did you play any particular roles in the GreenHouse community? (guild mentor, design group, ecological citizenship, etc.)
 - iii. What did you like most/least?
- 6) Did you engage in any service-related activities while living in GreenHouse?
 - a. Were they related to service to the GH community, the UVM community, or to the greater Burlington/Winooski Watershed communities?
- 7) Please describe the GreenHouse community.
 - a. To what extent did you feel there was a sense of community within GH?
 - b. Were there structures in place to help with socialization in GH?
 - c. Is there any relationship between GreenHouse and your “sense of place” within the UVM community?
- 8) Recommendations
 - a. Looking back, what would you suggest GH faculty/staff do improve the development of a sense of community in GH?
 - b. Do you have any recommendations for changes or additions to current programming? (courses, events/activities, guilds, leadership, etc.)
- 9) In your opinion, what do you think the role of GreenHouse should be?
 - a. What is its greatest potential?